Vol. 1112 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

PATENTS

March 13, 1990

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

March 13, 1990 Volume 1112 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
...Nc corresponding prior U.S. national application filed	550.00
...Corresponding prior U.S. national application filed	380.00
...Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
...Search fee paid to USPTO as ISA.	400.00
...Additional examination fee, per additional invention	130.00
...ISA not the USPTO	600.00
...Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
...For each independent claim in excess of 3	18.00	36.00
...For each claim in excess of 20	6.00	12.00
...For each application containing a multiple dependent claim	60.00	120.00
...Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
...Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 10, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,648,136 through 4,649,570
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 8, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,375,702 through 4,376,311
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 22, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,306,883	06/230,064	12/22/81
4,306,884	06/217,703	12/22/81
4,306,987	06/220,870	12/22/81
4,307,019	06/219,563	12/22/81
4,307,075	06/225,175	12/22/81
4,307,102	06/235,435	12/22/81
4,307,123	06/221,175	12/22/81
4,307,270	06/223,820	12/22/81
4,559,647	06/648,808	12/24/85
4,559,648	06/625,506	12/24/85
4,559,658	06/607,444	12/24/85
4,559,659	06/575,674	12/24/85
4,559,660	06/551,015	12/24/85
4,559,675	06/561,735	12/24/85
4,559,681	06/516,981	12/24/85
4,559,687	06/631,833	12/24/85
4,559,690	06/515,849	12/24/85
4,559,705	06/554,884	12/24/85
4,559,708	06/402,512	12/24/85
4,559,711	06/391,475	12/24/85
4,559,723	06/568,390	12/24/85
4,559,727	06/530,953	12/24/85
4,559,729	06/320,642	12/24/85
4,559,730	06/469,307	12/24/85
4,559,746	06/643,117	12/24/85
4,559,750	06/561,038	12/24/85
4,559,751	06/585,043	12/24/85
4,559,759	06/541,535	12/24/85
4,559,762	06/525,420	12/24/85
4,559,764	06/572,275	12/24/85
4,559,768	06/614,227	12/24/85
4,559,772	06/464,037	12/24/85
4,559,779	06/756,958	12/24/85
4,559,780	06/435,942	12/24/85
4,559,781	06/546,774	12/24/85
4,559,785	06/690,087	12/24/85
4,559,788	06/535,658	12/24/85
4,559,790	06/434,786	12/24/85
4,559,791	06/668,250	12/24/85
4,559,792	06/650,262	12/24/85
4,559,809	06/632,021	12/24/85
4,559,812	06/618,856	12/24/85
4,559,823	06/662,378	12/24/85
4,559,825	06/580,268	12/24/85
4,559,829	06/624,514	12/24/85
4,559,831	06/647,568	12/24/85
4,559,843	06/419,825	12/24/85
4,559,844	06/391,463	12/24/85
4,559,853	06/633,580	12/24/85
4,559,854	06/637,859	12/24/85
4,559,856	06/504,978	12/24/85
4,559,860	06/709,248	12/24/85
4,559,866	06/256,684	12/24/85
4,559,869	06/626,295	12/24/85
4,559,875	06/591,202	12/24/85
4,559,878	06/642,520	12/24/85
4,559,889	06/624,776	12/24/85
4,559,894	06/702,405	12/24/85
4,559,914	06/633,096	12/24/85
4,559,918	06/486,304	12/24/85
4,559,920	06/687,979	12/24/85
4,559,923	06/604,871	12/24/85
4,559,930	06/607,976	12/24/85
4,559,936	06/536,972	12/24/85
4,559,939	06/579,238	12/24/85
4,559,942	06/584,923	12/24/85
4,559,956	06/470,032	12/24/85
4,559,957	06/572,894	12/24/85
4,559,960	06/543,979	12/24/85
4,559,962	06/694,030	12/24/85
4,559,968	06/652,165	12/24/85
4,559,970	06/552,322	12/24/85
4,559,972	06/484,335	12/24/85
4,559,978	06/592,939	12/24/85
4,559,998	06/619,746	12/24/85
4,560,002	06/568,680	12/24/85
4,560,005	06/685,942	12/24/85
4,560,007	06/577,246	12/24/85
4,560,009	06/608,766	12/24/85
4,560,010	06/400,076	12/24/85
4,560,011	06/623,789	12/24/85
4,560,021	06/491,329	12/24/85
4,560,022	06/630,220	12/24/85
4,560,028	06/720,935	12/24/85
4,560,033	06/330,565	12/24/85
4,560,034	06/747,685	12/24/85
4,560,036	06/568,478	12/24/85

Patent Number	Serial Number	Issue Date
4,560,038	06/692,327	12/24/85
4,560,039	06/609,683	12/24/85
4,560,040	06/458,971	12/24/85
4,560,042	06/605,627	12/24/85
4,560,055	06/348,073	12/24/85
4,560,064	06/635,998	12/24/85
4,560,071	06/574,333	12/24/85
4,560,072	06/469,308	12/24/85
4,560,075	06/618,623	12/24/85
4,560,082	06/631,794	12/24/85
4,560,084	06/689,877	12/24/85
4,560,086	06/534,364	12/24/85
4,560,088	06/609,324	12/24/85
4,560,097	06/608,542	12/24/85
4,560,109	06/506,193	12/24/85
4,560,116	06/671,405	12/24/85
4,560,117	06/552,114	12/24/85
4,560,119	06/614,772	12/24/85
4,560,120	06/524,627	12/24/85
4,560,122	06/569,896	12/24/85
4,560,125	06/551,541	12/24/85
4,560,127	06/476,514	12/24/85
4,560,136	06/718,819	12/24/85
4,560,147	06/694,196	12/24/85
4,560,165	06/498,926	12/24/85
4,560,166	06/675,415	12/24/85
4,560,169	06/613,150	12/24/85
4,560,170	06/622,628	12/24/85
4,560,182	06/581,604	12/24/85
4,560,183	06/559,956	12/24/85
4,560,191	06/512,786	12/24/85
4,560,209	06/519,951	12/24/85
4,560,211	06/441,267	12/24/85
4,560,215	06/611,340	12/24/85
4,560,229	06/653,154	12/24/85
4,560,244	06/623,891	12/24/85
4,560,250	06/414,920	12/24/85
4,560,251	06/659,966	12/24/85
4,560,255	06/493,911	12/24/85
4,560,257	06/431,529	12/24/85
4,560,294	06/574,909	12/24/85
4,560,295	06/505,081	12/24/85
4,560,296	06/616,434	12/24/85
4,560,300	06/582,458	12/24/85
4,560,303	06/562,427	12/24/85
4,560,306	06/482,373	12/24/85
4,560,309	06/460,815	12/24/85
4,560,310	06/580,903	12/24/85
4,560,320	06/701,805	12/24/85
4,560,328	06/621,473	12/24/85
4,560,331	06/668,651	12/24/85
4,560,344	06/560,141	12/24/85
4,560,359	06/591,797	12/24/85
4,560,361	06/603,249	12/24/85
4,560,366	06/577,720	12/24/85
4,560,367	06/544,742	12/24/85
4,460,368	06/645,981	12/24/85
4,560,376	06/571,367	12/24/85
4,560,378	06/529,368	12/24/85
4,560,380	06/427,703	12/24/85
4,560,383	06/545,829	12/24/85
4,560,386	06/590,478	12/24/85
4,560,388	06/598,951	12/24/85
4,560,389	06/706,763	12/24/85
4,560,390	06/534,618	12/24/85
4,560,412	06/592,816	12/24/85
4,560,442	06/589,915	12/24/85
4,560,450	06/724,707	12/24/85
4,560,453	06/717,431	12/24/85
4,560,454	06/705,687	12/24/85
4,560,455	06/662,309	12/24/85
4,560,458	06/690,380	12/24/85
4,560,459	06/581,695	12/24/85
4,560,464	06/553,546	12/24/85
4,560,483	06/606,966	12/24/85
4,560,499	06/609,349	12/24/85
4,560,500	06/613,568	12/24/85
4,560,502	06/440,344	12/24/85
4,560,514	06/607,350	12/24/85
4,560,528	06/367,343	12/24/85
4,560,536	06/648,414	12/24/85
4,560,540	06/534,464	12/24/85
4,560,553	06/554,026	12/24/85
4,560,555	06/560,867	12/24/85
4,560,558	06/494,751	12/24/85
4,560,563	06/481,270	12/24/85
4,560,572	06/544,599	12/24/85
4,560,579	06/693,544	12/24/85
4,560,589	06/533,649	12/24/85
4,560,590	06/551,992	12/24/85
4,560,598	06/680,601	12/24/85
4,560,600	06/658,141	12/24/85
4,560,604	06/643,054	12/24/85
4,560,629	06/281,549	12/24/85
4,560,632	06/637,696	12/24/85
4,560,657	06/515,711	12/24/85
4,560,665	06/613,893	12/24/85
4,560,672	06/616,968	12/24/85
4,560,682	06/682,006	12/24/85
4,560,683	06/509,043	12/24/85
4,560,694	06/496,715	12/24/85
4,560,702	06/505,058	12/24/85
4,560,705	06/729,895	12/24/85
4,560,712	06/686,775	12/24/85
4,560,724	06/625,669	12/24/85
4,560,730	06/673,707	12/24/85
4,560,738	06/524,955	12/24/85
4,560,752	06/625,394	12/24/85
4,560,753	06/541,199	12/24/85
4,560,757	06/530,513	12/24/85
4,560,758	06/674,380	12/24/85
4,560,767	06/505,527	12/24/85
4,560,779	06/400,179	12/24/85
4,560,780	06/671,102	12/24/85
4,560,787	06/632,672	12/24/85
4,560,791	06/551,480	12/24/85
4,560,797	06/451,701	12/24/85
4,560,798	06/664,815	12/24/85
4,560,802	06/620,086	12/24/85
4,560,811	06/571,961	12/24/85
4,560,818	06/685,584	12/24/85
4,560,819	06/650,396	12/24/85
4,560,831	06/629,019	12/24/85
4,560,833	06/573,553	12/24/85
4,560,840	06/584,579	12/24/85
4,560,849	06/620,287	12/24/85
4,560,860	06/683,151	12/24/85
4,560,868	06/462,702	12/24/85
4,560,876	06/540,087	12/24/85
4,560,883	06/480,662	12/24/85
4,560,893	06/600,048	12/24/85
4,560,904	06/551,523	12/24/85
4,560,926	06/455,524	12/24/85
4,560,931	06/403,030	12/24/85
4,560,935	06/479,805	12/24/85
4,560,951	06/576,297	12/24/85
4,560,958	06/583,510	12/24/85
4,560,969	06/557,360	12/24/85
4,560,972	06/457,357	12/24/85
4,560,973	06/551,896	12/24/85
4,560,975	06/360,209	12/24/85
4,560,978	06/622,109	12/24/85
4,560,980	06/438,493	12/24/85
4,560,986	06/571,343	12/24/85
4,561,003	06/600,192	12/24/85
4,561,007	06/650,636	12/24/85
4,561,012	06/565,285	12/24/85
4,561,015	06/476,291	12/24/85
4,561,030	06/399,931	12/24/85
4,561,038	06/596,558	12/24/85
4,561,042	06/599,965	12/24/85
4,561,043	06/654,983	12/24/85
4,561,076	06/498,778	12/24/85
4,561,088	06/579,326	12/24/85
4,561,116	06/568,203	12/24/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,660,131, Re. S. N. 07/472,172, Filed Jan. 30, 1990, Cl. 362/223, METHOD FOR INDIRECT LIGHTING, Douglas J. Herst, et al., Owner of Record: *Inventor*, Attorney or Agent: Donald L. Beeson, Ex. Gp.: 346

4,667,275, Re. S. N. 07/472,171, Filed Jan. 30, 1990, Cl. 362/223, LUMINAIRE FOR INDIRECT LIGHTING, Douglas J. Herst, et al., Owner of Record: *Inventor*, Attorney or Agent: Donald L. Beeson, Ex. Gp.: 346

4,722,586, Re. S. N. 07/474,596, Filed Feb. 1, 1990, Cl. 350/096, ELECTO-OPTICAL TRANSDUCER MODULE, Ronald K. Dodson, et al., Owner of Record: *Tektronix, Inc., Beakerton, Oreg.*, Attorney or Agent: William K. Bucher, Ex. Gp.: 251

4,729,999, Re. S. N. 07/473,639, Filed Feb. 1, 1990, Cl. 514/229, ANTIESTROGEN THERAPY FOR SYMPTOMS OF ESTROGEN DEFICIENCY, Ronald L. Young, Owner of Record: *BCM Technologies, Inc., The Woodlands, Tex.*, Attorney or Agent: Eric P. Mirabel, Ex. Gp.: 125

4,762,360, Re. S. N. 07/472,656, Filed Jan. 30, 1990, Cl. 296/100, DEMOUNTABLE PICK-UP TRUCK TONNEAU COVER, Roy L. Huber, Owner of Record: *Inventor*, Attorney or Agent: Alex Rhodes, Ex. Gp.: 312

4,775,978, Re. S. N. 07/473,884, Filed Feb. 2, 1990, Cl. 371/038, DATA ERROR CORRECTION SYSTEM, Carl B. Hartness, Owner of Record: *Magnetic Peripherals*, Attorney or Agent: Paul O'Malley, Ex. Gp.: 236

4,817,215, Re. S. N. 07/471,569, Filed Jan. 29, 1990, Cl. 4/236, TOILETS, John M. Stewart, Owner of Record: *Sanitation Equipment Ltd.*, Attorney or Agent: David W. R. Langton, Ex. Gp.: 243

4,844,273, Re. S. N. 07/470,094, Filed Jan. 25, 1990, Cl. 215/329, CLOSURE WITH ENHANCED SEALING, H. Gene Hawkins, Owner of Record: *Sunbeam Plastics Corp., Evansville, Ind.*, Attorney or Agent: Alfred L. Patmore, Jr., Ex. Gp.: 241

4,848,901, Re. S. N. 07/470,290, Filed Jan. 25, 1990, Cl. 356/041, PULSE OXIMETER SENSOR CONTROL SYSTEM, Rush W. Hood, Jr., Owner of Record: *Critikon, Inc.*, Attorney or Agent: Paul A. Coletti, Ex. Gp.: 255

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 32,702, Reexam No. 90/001,932, Requested Feb. 6, 1990, Cl. 360/97, BRUSHLESS D.C. MOTOR ASSEMBLY, Alfred Hasler, et al., Owner of Record: *Papst-Motoren GmbH & Co., St. Georgen, Fed. Rep. of Germany*, Attorney or Agent: Finnegan, Henderson, Farabow, et al., Ex. Gp.: 230, Requester: Owner

4,839,062, Reexam No. 90/001,933, Requested Feb. 6, 1990, Cl. 210/776, METHOD OF HARVESTING DEVICE FOR BRINE SHRIMP EGGS, Bruce G. Sanders, Owner of Record: *Sanders Brine Shrimp Co., Ogden, Utah*, Attorney or Agent: Thorpe, North & Western, Ex. Gp. 320, Requester: K. S. Cornaby, Salt Lake City, Utah

4,845,175, Reexam No. 90/001,931, Requested Feb. 1, 1990, Cl. 526/200, PREPARATION OF AQUEOUS POLYMER EMULSIONS IN THE PRESENCE OF HYDROPHOBICALLY MODIFIED HYDROXYETHYLCELLULOSE, Chia-Chen Lo, Owner of Record: *Union Carbide Corp., Norwich, Conn.*, Attorney or Agent: Unknown, Ex. Gp.: 150, Requester: Aqualon Co., Wilmington, Del.

Service by Publication

A petition to cancel each of the following registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal reprsentatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

The Norman Rockwell Museum, Inc., Northbrook, Ill., Reg. No. 1,297,597, for the mark "NORMAN ROCKWELL MUSEUM SEAL OF AUTHENTICITY" and design, Canc. No. 18,252.

Pocketsavers Plus, Inc., Madison Heights, Mich., Reg. No. 1,533,552, for the mark "PSP" and design, Canc. No. 18,318.

Infoview, Inc., Oklahoma City, Okala., Reg. No. 1,337,255, for the mark "INFOVIEW" and design, Canc. No. 18,321.

Research Media, Inc., Hicksville, N. Y., Reg. No. 920,295, for the mark "IFI", Canc. No. 18,365.

DHR, Inc., Boston. Mass., Reg. No. 972,423, for the mark "BENCHMARK", Canc. No. 18,400.

Caribou Farms, Inc., Presque Isle, Me., Reg. No. 633,370, for the mark "STOCKHOLM ETC" and design, Canc. No. 18,407.

Tara, Inc., Lubbock, Tex., Reg. No. 916,747, for the mark "MARKET MASTER", Canc. No. 18,427.

South Bend Beauty Supply Co., Inc., Mishawaka, Ind., Reg. No. 1,293,690, for the mark "BEAUTYMART DISCOUNT", Canc. No. 18,291.

Robar Distributing Co., Inc., Westlake Village, Calif., Reg. No. 1,297,718, for the mark "ALOHA SANDALS" (Stylized), Canc. No. 18,302.

SCA Corporation, Kirkland, Wash., Reg. No. 1,462,706, for the mark "NUVALARIUM", Canc. No. 18,317.

Hallford Investments, Inc., Ft. Smith, Ark., Reg. No. 1,343,502, for the mark "CONTAINERS PLUS" and design, Canc. No. 18,382.

Containers Etc. Systems Inc., Tyler, Tex., Reg. No. 1,339,689, for the mark "CONTAINERS ETC.", Canc. No. 18,274.

Synapse Computer Corp., Milpitas, Calif., Reg. No. 1,321,850, for Miscellanous Design, Canc. No. 18,313.

Ski Lift, Inc., Zephyr Cove, Nev., Reg. No. 1,461,080, for the mark "SKI LIFT", Canc. No. 18,323.

Memotech Corp., Denver, Colo., Reg. No. 1,308,726, for the mark "MEMOTECH", Canc. No. 18,335.

Esbeco Distilling Corp., Stamford, Conn. Reg. No. 540,324, for the mark "STRATHMORE CLUB", Canc. No. 18,417.

ERMA S. BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

PATENTS AVAILABLE FOR LICENSE OR SALE

General Electric Company is prepared to grant non-exclusive license under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, GE Appliances, General Electric Company, Appliance Park 2-226, Louisville, Ky. 40225.

D. 301,534	COMBINED GRATE AND DRIP PAN ASSEMBLY FOR A GAS COOKING APPLIANCE
4,136,529	AIR CONDITIONING APPARATUS
4,241,589	HOUSEHOLD REFRIGERATOR AIR FLOW CONTROL ASSEMBLY
4,375,752	AIR CONDITIONING APPARATUS
4,378,679	AIR CONDITIONING APPARATUS
4,382,369	AIR CONDITIONING APPARATUS
4,397,101	AUTOMATIC DRYER CONTROL
4,474,030	REVERSIBLE REFRIGERATOR HEAT PUMP SYSTEM
4,478,048	AN AIR SENSING CONTROL SYSTEM FOR AIR CONDITIONERS
4,484,243	PROTECTIVE CIRCUIT ARRANGEMENT FOR A SHEATHED HEATING ELEMENT
4,492,368	FORCE APPLYING APPARATUS
4,825,028	MAGNETRON WITH MICROPROCESSOR POWER CONTROL
4,828,887	METHOD AND APPARATUS FOR APPLYING MATERIAL TO SELECTED AREAS OF A MOVING PART
4,828,977	CONVEYOR LINE TRAINING SIMULATOR SYSTEM AND METHOD
4,860,938	AUTOMATED METHOD OF BRAZING

4,102,564, PORTABLE DEVICE FOR THE ACCURATE MEASUREMENT OF EYE MOVEMENTS BOTH IN LIGHT AND OBSCURITY, Henry L. Michael, P.O. Box 13137, El Paso, Tex. 79913

4,266,112, WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Drive, Greene Bay, Wisc. 54301

4,482,939, DIRECTIONALLY VARIABLE LIGHTING ASSEMBLY, Andrew Tishman, 170 East 88 St. #8B, New York, N.Y. 10128

4,576,178, AUDIO SIGNAL GENERATOR, David Johnson, Box 68, 436 East 69th St., New York, N.Y. 10021

4,654,512, MACHINE READABLE INFORMATION CARRIER, Peter K. Kontler, One Landmark Square, Stamford, Conn. 06901

4,702,704, TETRAHEDRAL CONDON STEREO TABLE, Leonard R. Svensson, Birch, Stewart, Kolash & Birch, 301 N. Washington St. P.O. Box 747, Falls Church, Va. 22046

4,777,849, CLEO-SEARS, Davis, Wright, Unrein, Hummer & McCallister, Attn: Bruce J. Clark P.O. Box 4385, Topeka, Kans. 66604

4,868,448, PIESOELECTRIC RELAY SWITCHING MATRIX, General Electric Company, P.O. Box 8, Bldg. K-1, Rm. 4A70, Schenetady, N.Y. 12301

Notice Interpreting In Re Iwahashi (Fed. Cir. 1989)

The Patent and Trademark Office's (PTO's) policy on the patentability of claims reciting matematical algorithms and computer programs, published at 1106 Off. Gaz. Pat. Office 5-12 (Sept. 5, 1989), is unaffected by *In re Iwahashi*, 888 F.2d 1370, 12 USPQ2d 1980 (Fed. Cir. 1989). The following comments are intended as the PTO's interpretation of *Iwahashi*.

Iwahashi reversed a rejection of appellants' apparatus claim 1 (the sole claim) under 35 U.S.C. §101. The rejection maintained that claim 1 was directed to nonstatutory subject matter in the form of a mathematical algorithm. Appellants developed an approximation to the conventional equation for auto-correlation coefficients for use in pattern recognition which uses a term which is the square of the sum of two variables, instead of the product of the two variables. Appellants' claim to an autocorrelation unit is in "means-plus-function" format except for a recited "read only memory" ("ROM") for implementing the squaring term. PTO argued that the term "read only memory" as used in this claim is as broad as a means-plus-function recitation with the result that the claim is effectively entirely in means-plus-function format and indistinguishable for §101 purposes from a method claim; it was argued that such a corresponding method claim would be nonstatutory. *See In re Freeman*, 573 F.2d 1237, 1247, 197 USPQ 464, 472 (CCPA 1978); *In re Walter*, 618 F.2d 758, 768, 205 USPQ 397, 407-08 (CCPA 1980); *In re Abele*, 684 F.2d 902, 909, 214 USPQ 682, 688 (CCPA 1982); *In re Meyer*, 688 F.2d 789, 796, 215 USPQ 193, 198-99 (CCPA 1982); and 1106 Off. Gaz. Pat. Office at 8, under "'Process' versus 'apparatus' claims." PTO also argued that appellants' apparatus claim is nonstatutory when directly analyzed according to the two-part *Freeman-Walter* test because (1) it recites a mathematical algorithm and (2) the algorithm does not "define" a structural relationship between physical elements and is not "applied" in any manner to physical elements.

The Federal Circuit determined that a read only memory is a "term[] well understood by those skilled in the art," 888 F.2d at 1372, 12 USPQ2d at 1909, and that the claimed read only memory element "is not in means-plus-function form," *id.* at 1373, 12 USPQ2d at 1909, but "is a specific piece of apparatus," *id.* at 1375, 12 USPQ2d at 1912. The Court states that appellants' apparatus claim does not meet the second part of the *Freeman-Walter* test, detailing the relationship between the ROM and the other means in the claim. Therefore, the Court concluded, *id.* at 1375, 12 USPQ2d at 1911:

> The claim as a whole certainly defines apparatus in the form of a combination of interrelated means and we cannot discern any logical reason why it should not be deemed statutory subject matter as either a machine or a manufacture as specified in §101. The fact that the apparatus operates according to an algorithm does not make it nonstatutory. . . . We therefore hold that the claim is directed to statutory subject matter.

Because the Court determined a ROM to be a specific piece of apparatus for implementing a table look-up function, and not as broad as a means-plus-function recitation, appellants carried their burden of demonstarting that the claim is "truly drawn to specific apparatus distinct from other apparatus capable of performing the identical functions," *Walter*, 618 F.2d at 768, 205 USPQ at 408; as a matter of claim interpretation, the claim cannot be treated as equivalent to a method. The *Walter* test for whether an apparatus claim is equivalent to a method claim is the same as applying the *Freeman-Walter* test to an apparatus claim. *See In re Maucorps*, 609 F.2d 481, 486, 203 USPQ 812, 816 (CCPA 1979) (application of second part of two-part *Freeman* test to appartus claim in "means for" format considers whether the "claimed invention as a whole comprises each and every means for carrying out a [mathematical algorithm]").

Once it is determined that the claim is truley drawn to specific apparatus, it necessarily follows that the apparatus is statutory subject matter under §101. True apparatus does not invoke the mathematical algorithm exception because the mathematical algorithm remains free for use by anyone not employing the specific apparatus, i.e., there is no preemption, in whole or part, of the mathematical algorithm itself. *See In re Bernhart*, 417 F.2d 1395, 1399, 163 USPQ 611, 616 (CCPA 1969) ("a member of the public would have to do much more than use the equations to infringe any of these [apparatus] claims"); *Freeman*, 573 F.2d at 1247 n.11, 197 USPQ at 472 n.11 ("the calculation method [in dependent claim 10] remained free for use by anyone not employing the enire apparatus of claim 9"). Importantly, as the *Iwahashi* Court notes: [t]he fact that apparatus operates according to an algorithm does not make it nonstatutory," 888 F.2d at 1375, 12 USPQ2d at 1911. *See Freeman*, 573 F.2d at 1247 n.10, 197 USPQ at 472 n.10 (" A claim to a new, useful, and unobvious computer, describing that computer in truly structural terms, would not be rejectable on the ground that the only known use for that computer is the performance of unpatentable methods of calculation.").

The Court's holding that the claim defines apparatus because of ROM is a specific piece of apparatus for implementing the mathematical algorithm is consistent with precedent and PTO policy as set forth at 1106 Off. Gaz. Pat. Office 5-12. Every case, however, must be determined on its facts and, to be consistent

with previous decisions, *Iwahashi* does not "hold that the mere presence of apparatus language in a claim will, of itself, save that claim from rejection as nonstatutory." *id.* at 1247 n.11, 197 USPQ at 472 n.11. Under *Walter*, the inquiry with every apparatus claim should be whether the apparatus encompasses any and every means for performing the recited functions and, if this appears to be the case, the burden should be placed on the applicant to show that it does not.

The Court's dicta in footnote 1 (the sole footnote) suggests that §112 ¶6 may require the PTO to construe means-plus-function limitation to the apparatus disclosed in the application and equivalents thereof. Under this suggestion, even a claim which is *entirely* in means-plus-function format could not be treated as indistinguishable from a corresponding method claim for §101 purposes. Such a result would be directly contrary to precedent, including *Freeman*, *Walter*, *Abele* and *Meyer*. In the opinion of the PTO, means-plus-function limitations should be not treated differently for §101 purposes than for §102 and §103 purposes for rejections over prior art. Indeed, during prosecution claims should be given their broadest reasonable interpretation. *See In re Zletz*, ___ F.2d ___, ___, 13 USPQ2d 1320, 1321-22 (Fed. Cir. 1989). The issue of claim scope should be treated as a matter of burden of proof: examiners should give "means for" limitations their broadest reasonable interpretation and then it is applicant's burden to show that the functionally-defined disclosed means do not encompass any and every means for performing the recited functions. *See Walter*, 618 F. 2d at 768, 205 USPQ at 408 ("the burden must be placed on the applicant to demonstrate that the claims are truly drawn to specific apparatus"); *Meyer*, 688 F.2d at 796 n.6, 215 USPQ at 199 n.6 and corresponding text; *In re Mulder*, 716 F.2d 1542, 1549, 219 USPQ 189, 196 (Fed. Cir. 1983) (involving a "means for" limitation in a §103 rejection: "Appellants have neither asserted nor shown that [the reference] structure is not the equivalent of the structure disclosed in their specification [for performing the function, as stated by the board]").

Feb. 15, 1990 JAMES E. DENNY
Acting Assistant Commissioner for Patents

REGISTRATION TO PRACTICE

This notice is being republished as in several entries Mississippi appeared instead of Michigan in the address.

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Oct. 11, 1989 were mailed to 650 candidates. The following list contains the names of persons who successfully passed the examination. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR 10.9(a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Feb. 23, 1990. Send information to be considered to the following address: U. S. Patent and Trademark Office, Box OED, Washington, D. C. 20231.

Dec. 27, 1989 CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline

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PATENT NOTICES

Certificates of Correction For Week of March 13, 1990

D. 301,211	4,814,093	4,831,156	4,836,875
D. 301,389	4,816,366	4,831,165	4,837,044
D. 301,424	4,816,468	4,831,245	4,837,068
4,451,908	4,816,535	4,831,281	4,837,265
4,587,003	4,816,700	4,831,471	4,837,618
4,615,715	4,818,271	4,831,795	4,837,722
4,656,034	4,818,749	4,832,260	4,837,821
4,667,060	4,818,858	4,832,593	4,837,854
4,687,664	4,819,079	4,832,735	4,837,926
4,722,044	4,820,602	4,833,053	4,837,999
4,724,114	4,821,324	4,833,057	4,838,267
4,730,629	4,821,575	4,833,392	4,838,761
4,732,517	4,822,452	4,833,447	4,839,145
4,735,082	4,823,272	4,833,793	4,839,356
4,736,015	4,823,375	4,833,878	4,839,572
4,738,844	4,824,099	4,833,892	4,839,613
4,742,506	4,824,435	4,834,001	4,839,638
4,749,834	4,824,565	4,834,080	4,840,108
4,751,459	4,824,690	4,834,299	4,840,363
4,757,003	4,824,752	4,834,327	4,840,545
4,761,189	4,825,239	4,834,540	4,840,557
4,768,900	4,825,449	4,834,696	4,840,601
4,771,095	4,826,031	4,834,775	4,840,749
4,781,631	4,826,988	4,834,791	4,840,832
4,783,435	4,826,999	4,834,800	4,840,852
4,790,508	4,827,468	4,835,236	4,841,276
4,790,594	4,828,286	4,835,364	4,841,965
4,791,549	4,828,566	4,835,416	4,842,898
4,794,442	4,828,568	4,835,444	4,843,046
4,794,796	4,828,581	4,835,790	4,843,672
4,801,138	4,828,627	4,835,993	4,843,824
4,803,004	4,828,738	4,836,086	4,844,499
4,805,725	4,828,846	4,836,115	4,844,798
4,805,898	4,829,041	4,836,314	4,844,814
4,806,572	4,829,204	4,836,386	4,852,218
4,806,684	4,829,512	4,836,418	4,853,547
4,808,016	4,829,893	4,836,672	4,865,204
4,809,604	4,830,570	4,836,767	4,868,629
4,810,908	4,831,076	4,836,778	

Erratum

In the Notice of Certificate of Correction appearing at 1107 O.G. 89 of October 31, 1989, Patent No. 4,801,980 should be Patent No. 4,801,890.

Disclaimers

3,882,577.—*Edward I. Aronoff*, Quebec, Canada. APPARATUS FOR TREATING TUBULAR FABRICS. Patent dated May 13, 1975. Disclaimer filed Dec. 29, 1989, by the inventor.

The term of this patent subsequent to December 31, 1989, has been disclaimed.

3,958,432.—*Edward I. Aronoff*, Quebec, Canada. APPARATUS FOR TREATING TUBULAR FABRICS. Patent dated May 25, 1976. Disclaimer filed Dec. 29, 1989, by the inventor.

The term of this patent subsequent to December 31, 1989, has been disclaimed.

4,085,484.—*Edward I. Arnoff*, St. Laurent; *William J. McLay; Robert E. Mitchell*, both of Montreal, all of Canada. APPARATUS FOR TREATING TUBULAR FABRICS. Patent dated Apr. 25, 1978. Disclaimer filed Dec. 29, 1989, by the assignee, Knit-Fin Machinery Ltd.

The term of this patent subsequent to December 31, 1989, has been disclaimed.

4,129,444.—*Dennis G. Dreyer*, Kokomo; *Edward M. Foley*, Russiaville; *Herbert E. Rogers, Jr.*, Sharpsville, all of Ind. POWER METALLURGY COMPACTS AND PRODUCTS OF HIGH PERFORMANCE ALLOYS. Patent dated Dec. 12, 1978. Disclaimer filed Dec. 21, 1989, by the assignee, Stoody Deloro Stellite, Inc.

The term of this patent subsequent to November 5, 1991, has been disclaimed.

4,150,948.—*Edward I. Arnoff*, St. Laurent; *William J. McLay;* Montreal, both of Canada. METHOD FOR TREATING TUBULAR FABRICS. Patent dated Apr. 24, 1979. Disclaimer filed Dec. 29, 1989, by the assignee, Knit-Fin Machinery Ltd.

The term of this patent subsequent to December 31, 1989, has been disclaimed.

4,503,080.—*William J. Brabbs*, Cincinnati; *Charles A. Hong*, Deerfield Township, both of Ohio. DOUGHS AND COOKIES PROVIDING STORAGE-STABLE TEXTURE VARIABILITY. Patent dated Mar. 5, 1985. Disclaimer filed Jan. 8, 1990, by the assignee, The Proctor & Gamble Company.

Hereby enters this disclaimer to claims 29-35 of said patent.

4,842,369.—*Kazuo Minoura*; *Kazuhiko Matsuoka*, both of Yokohama, Japan. LIGHT MODULATION ELEMENT AND LIGHT MODULATION APPARATUS. Patent dated June 27, 1989. Disclaimer filed Dec. 14, 1989, by the assignee, Cannon Kabushiki Kaisha.

Hereby enters this disclaimer to claim 22 of said patent.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF January 27, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	9-1-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during January 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,707,729 to 3,714,667 inclusive
Plant Patents ..... 3281 to 3296 inclusive

REEXAMINATIONS

MARCH 13, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,808,925 (1215th)
ROTARY VENEER CLIPPER
John E. Hards, Delta, Canada, assignor to Durand-Raute Industries, Ltd.
Reexamination Request No. 90/001,592, Aug. 31, 1988.
Reexamination Certificate for Patent No. 3,808,925, issued May 7, 1974, Ser. No. 339,746, Mar. 12, 1973.
Int. Cl.[4] B27L *5/08*
U.S. Cl. 83—346

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2–8, dependent on an amended claim, are determined to be patentable.

1. Apparatus for cutting veneer and like strip material into continuously varying lengths comprising a rotatable support drum over which veneer to be clipped is moved, a thin blade having at least one cutting edge rotatably mounted above the support drum and adapted to be rotated around a longitudinal axis extending parallel to the drum, said blade being so positioned relative to the drum that the cutting edge cuts through veneer on the drum when said edge passes the drum during rotation of the blade, a rotatable bracing drum above *the longitudinal rotational axis of* the blade and extending parallel therewith and positioned to be engaged by an edge of the blade opposite the cutting edge thereof while said cutting edge is cutting through veneer on the support drum, and means for rotating the blade on command to cut the veneer at a desired position.

B1 3,882,745 (1216th)
METHOD AND APPARATUS FOR ACCURATE DIE-CUTTING
Clyde B. Garrett, Lanham, and William S. Thayer, Lutherville, both of Md., assignors to Koppers Co., Inc., Pittsburgh, Pa.
Reexamination Request No. 90/001,666, Dec. 14, 1988.
Reexamination Certificate for Patent No. 3,882,745, issued May 13, 1975, Ser. No. 319,163, Dec. 29, 1972.
Int. Cl.[4] B23D *25/16*; B26D *1/56*
U.S. Cl. 83—311

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 5–10 is confirmed.

Claim 1 is determined to be patentable as amended.

Claims 2–4 dependent on an amended claim, are determined to be patentable.

1. Apparatus for controlling the accuracy of cuts made in a paperboard blank passing between a pair of cooperating die and anvil cylinders comprising:

first drive means for rotating said die cylinder at a first angular velocity;

second drive means for rotating said anvil cylinder at a second angular velocity; and

selection means for controlling [second] *said* second drive means to selectively change and maintain said second velocity equal to, faster, or slower than said first angular velocity;

for controlling the velocity of said blank.

B1 4,248,813 (1218th)
PROCESS FOR PRODUCING HIGH DENSITY SINTERED PRODUCTS
Yoshinori Hattori; Mitsuyoshi Kawamura, and Yasushi Matsuo, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan
Reexamination Request No. 90/001,712, Dec. 28, 1988.
Reexamination Certificate for Patent No. 4,248,813, issued Feb. 3, 1981, Ser. No. 60,696, Jul. 25, 1979.
Claims priority, application Japan, Jul. 28, 1978, 53-93032
Int. Cl.[4] C04B *33/34*
U.S. Cl. 264—62

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 6 are determined to be patentable as amended.

Claims 2–5 and 7, dependent on an amended claim, are determined to be patentable.

New claims 8–10 are added and determined to be patentable.

1. In a process for producing a high density sintered product which comprises molding a composite of an inorganic *silicon* powder and *an* organic resin, burning off the organic resin and

sintering, the improvement which comprises after burning off the organic resin, coating the surface of the molding with a rubber film, pressing said molding under two ton/cm^2 or more of isostatic pressure, and then carrying out said sintering step.

B1 4,584,362 (1219th)
BISMUTH CATALYST SYSTEM FOR PREPARING POLYURETHANE ELASTOMERS

Arthur R. Leckart, Woodbridge, and H. Victor Hansen, Denville, both of N.J., assignors to Cosan Chemical Corporation, Carlstadt, N.J.

Reexamination Request No. 90/001,622, Oct. 17, 1988.
Reexamination Certificate for Patent No. 4,584,362, issued Apr. 22, 1986, Ser. No. 706,439, Feb. 27, 1985.
Int. Cl.[4] C08G *18/14*
U.S. Cl. 528—55

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 3, 6,** and **8** are determined to be patentable as amended.

Claims **2, 4–5, 7** and **9**, dependent on an amended claim, are determined to be patentable.

New claims **10–14** are added and determined to be patentable.

1. A process for preparing a polyurethane elastomer by reacting a polyol selected from polyether polyols and polyester polyols with an organic polyisocyanate wherein the ratio of NCO groups to hydroxyl groups is from 0.70 to 1 to 1.35 to 1 in the presence of a catalytic amount of a bismuth salt of a carboxylic acid having from **[2]** *6* to 20 carbon atoms in the molecule *and a tertiary carbon group adjacent the carboxyl group*, which salt is the sole catalyst in the reaction mixture.

B1 4,651,513 (1220th)
LAYERED STEEL CORD

Paul Dambre, Kemmel, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Reexamination Request No. 90/001,654, Dec. 1, 1988.
Reexamination Certificate for Patent No. 4,651,513, issued Mar. 24, 1987, Ser. No. 779,568, Sep. 24, 1985.
Claims priority, application United Kingdom, Sep. 24, 1984, 84-24086
Int. Cl.[4] D02G *3/48, 3/12*; D07B *1/06*
U.S. Cl. 57—217

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 13–21** and **43** are cancelled.

Claims **2, 3, 5, 6, 8–10, 12, 22, 25–28, 34, 36, 37, 40–42** and **44** are determined to be patentable as amended.

Claims **4, 7, 11, 23, 24, 29–33, 35, 38** and **39**, dependent on an amended claim, are determined to be patentable.

New Claims **45–47** are added and determined to be patentable.

45. A rubber adherable multilayer steel cord, comprising:
a wire core;
at least two wire layers, each said layer comprising a plurality of steel wires having a tensile strength in excess of 2200 N/mm^2, said layers consecutively arranged about said wire core, each of said wire layers having a thickness of about one wire diameter and forming a regular geometric packing having a specific shape and compactness;
the wires of the second outermost layer being covered with a corrosion resistant metal coating selected from the group consisting of zinc and a zinc alloy containing at least about 50% by weight zinc, and the other wires being covered with a brass coating having a thickness of from about 0.05 μm to about 0.50 μm, said brass coating being rubber adherable and containing copper in an amount of more than 55% by weight.

B1 4,784,132 (1221st)
METHOD OF AND APPARATUS FOR LASER TREATMENT OF BODY LUMENS

Kenneth R. Fox, 2716 N. Upshur St., Arlington, Va. 22207, and A. Arthur Coster, 3541 Braddock Rd., Alexandria, Va. 22301

Reexamination Request No. 90/001,737, Mar. 30, 1989.
Reexamination Certificate for Patent No. 4,784,132, issued Nov. 15, 1988, Ser. No. 772,697, Sep. 5, 1985.
Continuation-in-part of Ser. No. 478,781, Mar. 25, 1983, which is a continuation-in-part of Ser. No. 329,978, Dec. 11, 1981, abandoned, which is a continuation of Ser. No. 87,894, Jan. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 32,844, Apr. 24, 1979, abandoned.
Int. Cl.[4] H61B *17/36*
U.S. Cl. 606—15

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–15** is confirmed.

New claims **16** and **17** are added and determined to be patentable.

1. In a method of performing laser surgery in a body lumen comprising the steps of inserting a catheter into said body lumen, said catheter having a longitudinal axis and proximal and distal ends, at least one fiber means in said catheter for transmitting a beam of laser energy from said proximal to said distal end, positioning the distal end of said catheter adjacent an obstruction in said lumen and transmitting laser energy through said fiber means to impinge upon said obstruction, the improvement wherein said laser energy is a non-continuous wave, pulsed argon-ion laser beam having a pulse duration in the range of from 5 to 200 milliseconds, a pulse repetition rate of from about 1 to 50 pulses per second and a duty cycle of from about 5 to 50%, said pulse duration, pulse repetition rate and duty cycle being selected to effect damage to said obstruction with substantially no thermal necrosis of the surrounding tissue.

REISSUES

MARCH 13, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

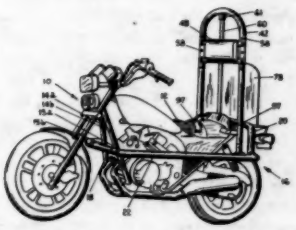
Re. 33,178
PROTECTIVE BAR ASSEMBLY FOR MOTORCYCLE

Russell W. Ahlberg, 2759 Leonard St., NW., Grand Rapids, Mich. 49504

Original No. 4,673,190, dated Jun. 16, 1987, Ser. No. 795,515, Nov. 6, 1985. Continuation-in-part of Ser. No. 655,053, Sep. 27, 1984, abandoned. Application for reissue Sep. 28, 1988, Ser. No. 250,334

Int. Cl.[4] B62J *27/00*

U.S. Cl. 280—304.3 **38 Claims**



28. A protective bar assembly according to claim 26 wherein the front bar of the protective bar assembly is attached to the front portion of the frame at a point above the lower portion thereof, each side bar including a front portion attached to the front bar and extending rearwardly and downwardly therefrom and being attached to the frame at a lower portion which is adjacent the foot rest, the side bar including a rearward portion attached to the lower portion of the frame and extending upwardly and rearwardly to the rear portion of the frame, the downwardly and rearwardly and upwardly and rearwardly extending portions of the side bar serving to protect a rider's legs from bumpers at different heights.

Re. 33,179
TOE ADJUSTMENT APPARATUS

Craig R. Pettibone, Lafayette, Colo., assignor to Specialty Products, Inc., Longmont, Colo.

Original No. 4,616,845, dated Oct. 14, 1986, Ser. No. 692,825, Jan. 18, 1985. Application for reissue Mar. 28, 1988, Ser. No. 174,492

Int. Cl.[4] B63D *17/00*

U.S. Cl. 280—661 **34 Claims**

2. A toe adjustment assembly for use in a rear wheel mounting and control assembly, provided on a rear portion of an automotive vehicle frame and body assembly, of the type having at least one rear wheel mounting assembly including a shock strut for supporting a spindle means operatively attached to the vehicle frame and body assembly; a spindle fixedly mounted at a lower end portion of the shock strut for rotatably supporting a wheel; and a wheel rotatably mounted on the spindle about a laterally extending wheel axis whereby the toe of said wheel is dependent upon the relative lateral position of a portion of said spindle and having a control assembly for controlling the toe of the wheel including at least one control arm for holding the lower end of the wheel strut at a predetermined lateral position relative the frame and body assembly, the control arm having a first end operatively associated with a centrally located control arm connection portion of the vehicle frame and body assembly and having a second end operatively associated with a portion of the spindle, the control arm extending generally transversely of a vehicle frame and body assembly central longitudinal axis;

said toe adjustment assembly comprising:

control arm adjustable lateral displacement means for adjustably displacing the control arm laterally inwardly and outwardly whereby a laterally moveable portion of the spindle is adjustably displaced inwardly and outwardly with respect to a relatively nonmoveable portion thereof whereby the toe of the wheel is adjusted inwardly and outwardly; [The invention of claim **1**] wherein said control arm adjustable lateral displacement mans comprises:

adjustable cam means associated with said control arm;

cam engagement means fixedly associated with said vehicle frame and body assembly and coacting with said cam means; and

laterally extending slot means fixedly associated with said vehicle frame and body assembly and adapted to laterally, shiftably accept a portion of said cam means therewithin in substantially nondisplaceable vertical relationship therewithin.

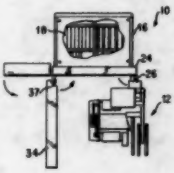
Re. 33,180
LIGHT WEIGHT CHASSIS AND CABINET ASSEMBLY FOR MAGNETIC TAPE RECORDER

William R. Davis, and David G. Hart, both of Sarasota, Fla., assignors to Fairchild Weston Systems, Inc., Syosset, N.Y.

Original No. 4,489,358, dated Dec. 18, 1984, Ser. No. 423,330, Sep. 24, 1982. Application for reissue Dec. 18, 1986, Ser. No. 943,050

Int. Cl.[4] G11B *00/00;* **H02B** *1/02*

U.S. Cl. 360—137 **14 Claims**



1. In a magnetic tape recorder, a light weight chassis and cabinet assembly, comprising

a rigid bezel;

a circuit boards support means, including a wire frame carrying opposed pairs of circuit board guides and electrical connector means positioned to be connected to circuit boards supported between said guide pairs;

first means for supporting said wire frame to said bezel such that said bezel prevents deformation of said wire frame[,

said circuit board guides being approximately perpendicular to a plane of said bezel];

a magnetic tape transport mechanism; and

second means for pivotably supporting said tape transport mechanism to one end of said bezel to enable said mechanism to be pivoted outwardly from said frame.

Re. 33,181

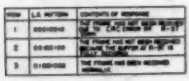
DATA TRANSMISSION SYSTEM ADAPTED TO FACILITATE DETECTION OF SAFE RECEIPT OF A TRANSMITTED DATA FRAME BY A RECEIVING STATION

Hisashi Matsumura, Hadano; Toyokazu Hashimoto, Kanagawa; Masahiko Kida, and Hiroyuki Wada, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,558,428, dated Dec. 10, 1985, Ser. No. 344,977, Feb. 2, 1982. Application for reissue Dec. 10, 1987, Ser. No. 131,110

Int. Cl.[4] **G06F** *13/00, 13/14, 13/38*

U.S. Cl. 364—900 **17 Claims**



1. A data transmission system comprising a loop transmission path for transmitting signals representing a frame of data and a plurality of data stations connected to the transmission path and having respective addresses within the system, each of said stations comprising:

means for generating signals representing a frame of data including a data portion, an answer information portion, a sending-station address portion and a receiving-station address portion;

means for sending out said signals representing the frame of data produced by said generating means to said loop transmission path with said data portion being positioned in advance of said answer portion;

means for receiving signals representing a frame of data transmitted on said loop transmission path and for retransmitting the received signals representing the entire frame of data on said loop transmission path; means for comparing the address of the station with the receiving-station address portion of the received frame of data received in the form of said signals on said loop transmission path to determine whether the frame of data is destined for said station;

means responsive to said comparing means for storing said signals representing at least the data portion of said received frame of data when the receiving-station address portion of said received frame of data coincides with the address of the receiving-station;

checking means connected to said receiving and retransmitting means for checking at least the data portion of said frame of data represented by said received signals to detect abnormalitites therein; and

first means coupled to said checking means for altering said received signals prior to retransmission by setting the answer information portion of the received frame of data to one of a plurality of selected code patterns depending on [whether or not said received frame of data has been normally received in said storage] *results of checking by said checking means.*

PLANT PATENTS

GRANTED MARCH 13, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,186

NECTARINE — EARLY RED JIM

James W. Taylor, Dinuba, Calif., assignor to Ito Packing Co., Inc., Reedley, Calif.

Filed Dec. 13, 1988, Ser. No. 283,990
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree with fruit of yellow flesh, cling stone type, substantially as herein shown and described, having a maturity period in the early part of the late season, and having fruit of good sugar content, the fruit being large with skin of a deep red color over much of the exterior, and flesh of a firm texture with good flavor.

7,187

MINIATURE ROSE PLANT NAMED 'ALWAYS A LADY'

Cecilia L. D. Bennett, deceased, late of 489 Minot Ave., Chula Vista, Calif. 92010 (by Susan Mae O'Brien, executrix)

Filed Jan. 3, 1989, Ser. No. 293,171
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant named, 'Always A Lady' of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea-form blooms, ranging from near Amaranth Rose to near Roseine Purple, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,188

MINIATURE ROSE PLANT NAMED 'HOT LIPS'

Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif., and by Susan M. O'Brien, administrator, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Jan. 3, 1989, Ser. No. 293,173
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant named, 'Hot Lips' of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea-form blooms, ranging from near Shrimp Red to near Chinese Coral to near Azalea Pink, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,189

MINIATURE ROSE PLANT NAMED 'RUTHIE'

Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif., and by Susan M. O'Brien, executrix, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Jan. 3, 1989, Ser. No. 293,175
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant named, 'Ruthie' of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea-form blooms, ranging from near Naples Yellow to White with a blush of near Poppy Red to near Carmine, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,190

MINIATURE ROSE PLANT NAMED 'ZELDA LLOYD'

Cecilia L. D. Bennett, deceased, late of Chula Vista, and by Susan M. O'Brien, executrix, 489 Minot Ave., Chula Vista, both of Calif. 92010

Filed Jan. 3, 1989, Ser. No. 293,174
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant named, 'Zelda Lloyd' of hardy, dwarf, moderate growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its five-petaled blooms of medium pink, ranging from near Carmine Rose to near Carmellia, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,191

MINIATURE ROSE PLANT NAMED 'CHRISTOPHER'

Cecilia L. D. Bennett, deceased, late of Chula Vista, and by Susan M. O'Brien, executrix, 489 Minot Ave., Chula Vista, both of Calif. 92010

Filed Jan. 3, 1989, Ser. No. 293,172
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant named, 'Christopher' of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea-form blooms, ranging from near Blood Red to near Cardinal Red, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,192

PLUM TREE, "ROYAL STAR"

Lawrence K. Kitahara, and Kei Kitahara, 242 W. Palm Ave., Reedley, Calif. 93654

Filed Feb. 17, 1989, Ser. No. 318,054
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of Plum Tree substantially as illustrated and described and which bears fruit somewhat similar to that of the Angeleno Plum Tree (U.S. Plant Pat. No. 2747) in the external color of the fruit and the late date of maturity, but which is distinguished therefrom and characterized principally as to novelty in that the fruit is of a large ovate shape with a blue color, a pink to red flesh color, a tight cling type stone and above average fruit quality, the fruit ripening in the last week of August to the first week of September under the ecological conditions prevailing in Kingsburg, Calif.

7,193

NECTARINE TREE (RED GLEN)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 23, 1988, Ser. No. 289,366
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which most nearly resembles the Kism Grand (U.S. Plant Pat. No. 5,666) nectarine variety by producing excellent flavored clingstone fruit that ripens in late July, but is distinguished from and an improvement on that variety by producing fruit that is dark red in skin color over the entire fruit surface, that is very much firmer for long distant shipping, and that remains crisp on the tree for 3 weeks,

which will accommodate for a longer and more flexible harvesting period and also make tree ripened fruit more attainable.

7,194

PEACH TREE "RED JACK"

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Feb. 27, 1989, Ser. No. 315,537

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described, with a low winter chilling requirement of approximately 150 hours and is of large size, vigorous, upright in growth and a regular and productive bearer of early maturing, medium size, yellow flesh, clingstone fruit with good flavor and eating quality; the fruit is further characterized by coloring 8 to 10 days before maturity and having firmer flesh and more attractive red skin color than most all other early maturing commercial varieties with a low winter chilling requirement.

7,195

WILLAMETTE CHESTNUT

Robert D. Wallace, Rte. 1, Box 341, Alachua, Fla. 32615

Filed Jun. 13, 1988, Ser. No. 206,876

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of hybrid chestnut tree, substantially as illustrated and described, which is of medium size, upright and widely spreading form, with large, glossy, dark green oblong leaves with dentate margins, flowering late and profusely after leaf out in spring; the tree being a regular and very prolific bearer of extremely large, chocolate brown, very sweet and easy-to-peel nuts that ripen in mid-September and are released easily from the burrs for easy harvesting; the trees showing a high genetic resistance to the chestnut bark blight; and the trees being especially characterized by having the combination of good orchard form, blight resistance.

PATENTS

GRANTED MAR. 13, 1990

ERRATA

For CLASS	See PATENT NO.
123-090	4,906,330
475-089	4,907,472
475-250	4,907,473
475-014	4,907,474
441-061	4,907,519
125-021	4,907,564
606-128	4,907,572
606-086	4,907,577
606-079	4,907,578
606-028	4,907,585
606-005	4,907,586
606-028	4,907,587
606-011	4,907,588
606-034	4,907,589
606-139	4,907,590
606-154	4,907,591
172-180	4,907,652
172-010	4,907,653
169-070	4,907,654
180-233	4,907,672
114-345	4,907,997
128-066	4,908,016
204-300	4,908,153
423-386	4,908,270
528-188	4,908,409
219-438	4,908,501
356-373	4,908,509
358-213	4,908,518
235-380	4,908,521
315-169	4,908,539
371-022	4,908,576
330-004	4,908,584
360-097	4,908,715
363-017	4,908,752
363-021	4,908,753
363-037	4,908,754
363-056	4,908,755
363-058	4,908,756
363-141	4,908,757
322-075	4,908,832
380-005	4,908,834
381-001	4,908,858

PATENTS

GRANTED MARCH 13, 1990

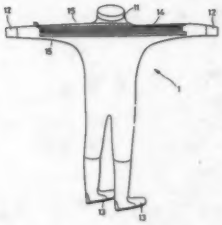
GENERAL AND MECHANICAL

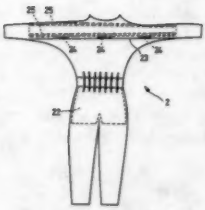
4,907,295

IMPROVED DIVING WET SUIT

Mamoru Yasuda, Ishinomaki, Japan, assignor to Tohoku Diving Center Co. Ltd., Miyagi, Japan

Filed Feb. 13, 1989, Ser. No. 309,557
Claims priority, application Japan, Jul. 18, 1988, 53-93964[U]
Int. Cl.[4] A62B *17/00*; B63C *11/04*
U.S. Cl. 2—2.1 R **1 Claim**





1. An improved diving wet suit comprising an inner shell comprised of a body formed of a nonstretch material comprising a flexible fabric-reinforced plastic sheet,

said inner shell further including neck, wrist and foot portions comprised of a stretchable waterproof material, said inner shell provided with: an opening extending from a back portion along both arms,

a waterproof fastening means extending from said back portion along both arms and adaapted to seal said opening in said inner shell,

an outer shell comprised of a resin-coated fabric, said outer shell provided with an opening extending from a back portion along both arms,

fastening means provided in each said inner and outer shells adapted to join said inner and outer shells together along said opening in said outer shell,

said inner and outer shells being provided with holes for mounting valves in the area of the breast and shoulders to permit said inner and outer shells to be fixedly held together between said valves, and

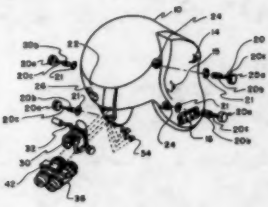
said outer shell including pad means positioned adjacent hip and leg portions.

4,907,296

APACHE HELMET MOUNTING STRUCTURE FOR AVIATORS NIGHT VISION IMAGING SYSTEM (ANVIS) AND METHOD

Bill A. Blecha, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1988, Ser. No. 210,475
Int. Cl.[4] A42B *3/02, 1/24*
U.S. Cl. 2—6 **2 Claims**



1. A method for mounting an aviator night vision imaging system (ANVIS) goggle system to an aviators helmet, said method comprising the steps of:

providing a mounting structure which is shaped and form fitted to the frontal area of said helmet;

forming a power cable retention means on the front of said mounting structure to secure power cables;

forming as an integral portion of said mounting structure a breakaway mount support pad with a downward extension in the center front of said mounting structure, said support pad is shaped to conform to the curvature of a goggle breakaway mount;

attaching said goggle breakaway mount to said support pad by a goggle attachment means;

attaching said structure to said helemt by a helmet attachment means comprised of at least two mounting points on each of the left side and right side helmet frontal areas; and

connecting said goggle system to said goggle breakaway mount wherein said goggle system is rotatable in the vertical direction between the aviators line of sight and in a forehead stow position.

4,907,297

GLOVE

Steven Gallucci, 1140-C Parkside Green Dr., West Palm Beach, Fla. 33415

Filed Jun. 13, 1988, Ser. No. 206,111
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—163 **10 Claims**

1. A glove having a palm portion and finger stall portions with enclosed tips, comprising:

a slit in each tip portion adapted to permit the passage of the tip of a fingernail, said slit having a longitudinal dimension slightly in excess of the thickness of the fingernail of the wearer, said dimension being aligned with the long axis of

the finger stall, said slit having a lateral dimension perpendicular to said longitudinal dimension, said lateral dimension being slightly in excess of the lateral dimension of said fingernail.

4,907,298

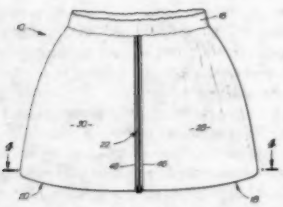
CONVERTIBLE PANTS/MINISHORTS

Adam Lisowski, Los Angeles, Calif., assignor to International Fashion Garments Ltd., Bangkok, Thailand

Filed Dec. 28, 1987, Ser. No. 138,295

Int. Cl.[4] A41D *15/02*

U.S. Cl. 2—212 **6 Claims**



1. An article of clothing comprising:

pants having a pair of leg portions;

frontal closure means for selectively closing the front of the leg portions together; and

rear closure means for selectively closing the rear of the leg portions together;

wherein the clothing article has the appearance of a skirt when the front and rear of the leg portions are respectively closed.

4,907,299

SHIELD MOUNTING ASSEMBLY FOR A SAFETY HELMET

Michio Arai, 1-164 Horinouchi, Ohmiya-shi, Saitama-ken, Japan

Filed May 25, 1988, Ser. No. 198,516

Claims priority, application Japan, Jun. 9, 1987, 62-144450

Int. Cl.[4] A61F *9/06*; A42B *1/08*

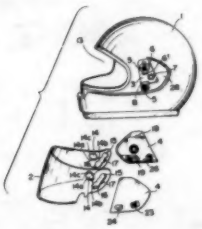
U.S. Cl. 2—424 **22 Claims**

1. A shield mounting assembly for a safety helmet of the type having a helmet body and a front opening, said assembly comprising:

(a) a left engaging base plate secured to a left outer surface of the helmet body, said left engaging base plate including a rotational axle, said rotational axle including an engaging recess therein;

(b) a right engaging base plate secured to a right outer surface of the helmet body, said right engaging base plate including a rotational axle, said rotational axle including an engaging recess therein;

(c) a shield rotatably supported by said left and right engaging base plates through a predetermined range of motion so as to cover the front opening in a closed position, said shield having left and right sides, each side including a mounting hole for receiving the rotational axle of a respective engaging base plate to rotatably support said shield on said engaging base plate;



(d) a shield keep cover detachably connected with an upper portion of each said engaging base plate, each said shield keep cover including an engaging projecting portion which fits into the engaging recess of a respective engaging base plate through the mounting hole, the engaging projecting portion being capable of being disengaged from the engaging recess of a respective engaging base plate only when the shield is rotated so that each mounting hole is aligned at a predetermined rotational position with the respective rotational axle; and

(e) rotation limiting means for limiting rotation of said shield through said predetermined range of motion.

4,907,300

HELMET AND VISOR MECHANISM THEREFOR

Ian T. Dampney, London, and Michael Good, Luton, both of England, assignors to Helmets Limited, St. Albans, United Kingdom

Filed Dec. 3, 1987, Ser. No. 128,108

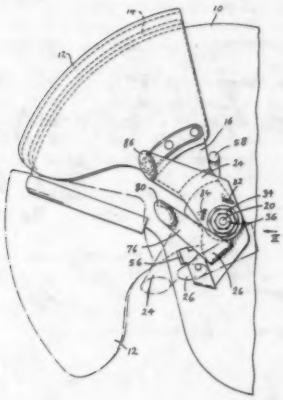
Claims priority, application United Kingdom, Dec. 3, 1986, 8628864

Int. Cl.[4] A42B *3/02*

U.S. Cl. 2—424 **10 Claims**

1. A helmet provided with a visor movable between a raised position and a lowered position, a releasable locking mechanism operable to lock the visor in the raised or the lowered position, and an operating lever positioned on the helmet for operation by the wearer using one hand and being movable between first and second positions, the lever being connected to the visor so that movement of the lever between its first and second positions moves the visor between its raised and lowered position, in which the locking mechanism comprises cooperating members connected to the helmet and the visor, respectively, the cooperating members being adapted to move into locking engagement with one another in response to movement of the visor to the raised or lowered position, thereby locking the visor in the raised or lowered position, and the operating lever is adapted to engage one of the cooperating

members to move it out of locking engagement during an initial part of the movement of the lever from its first or its



second position to allow the visor to be moved by the operating lever.

4,907,301

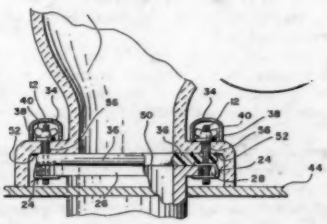
METHOD FOR SETTING TOILET BOWLS

Richard J. Tucker, 237 S. Spring, La Grange, Ill. 60525

Continuation-in-part of Ser. No. 34,678, Apr. 6, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 260,198

Int. Cl.[4] E03D *11/16*

U.S. Cl. 4—252 R **3 Claims**



1. A method for installation without using tools of a pre-existing toilet bowl base having at least one pre-existing color matched decorative cover cap and securing the pre-existing toilet bowl base to a soil pipe flange of uncertain height above a floor surface comprising:

placing a retaining clamp that is an eccentric c-shaped resilient structure with a prethreaded orifice in alignment with an aperture in the soil pipe flange:

inserting a lower end of a prethreaded mounting stud, having a headless upper end, into the retainer clamp and through the aperture by manually threading without tools said stud into the prethreaded orifice;

adjusting the prethreaded mounting stud to an appropriate height both to prevent interference with the pre-existing decorative cover cap and to compensate for uncertain height of the soil pipe flange above the floor surface;

placing a waxed sealing ring on the soil pipe flange to be compressed between said flange and the pre-existing toilet bowl base;

orienting the pre-existing base so that at least one opening therein is in alignment with a mounting stud;

lowering said base such that the mounting stud penetrates the opening in said base;

fastening the pre-existing toilet bowl base to the soil pipe flange using a wing nut which is manually threaded without tools down on the mounting stud and hand tightened to avoid axial pressure that would crack the pre-existing toilet bowl base, and in a manner by which later removability and resuability of the mounting stud is assured; and

placing the pre-existing decorative cover cap over the wing nut and upper end of the mounting stud to hide the same from view, to protect the same from condensation and other corrosive agents and to hide from view wax that may ooze through the opening in the toilet base from the wax ring compressed between the toilet bowl base and soil pipe flange.

4,907,302

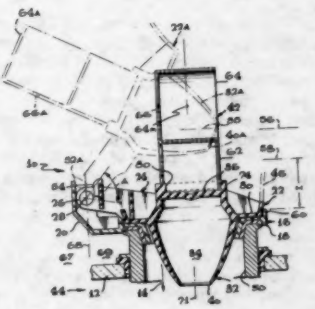
IN-FIELD INSTALLABLE CLOSING DELAY CUP

Adolf Schoepe, and Oscar R. Dufau, both of Fullerton, Calif., assignors to Fluidmaster Inc., Anaheim, Calif.

Filed Feb. 1, 1988, Ser. No. 150,739

Int. Cl.[4] E03D *1/34*

U.S. Cl. 4—382 **10 Claims**



1. A method for modifying a toilet flush valve which includes a valve member that has an inner end pivotally mounted about an axis and that has an outer end coupled to a chain device for flushing, wherein the outer end includes a tank ball that forms a largely closed chamber with an open bottom, the tank ball being highly buoyant when it is first pivoted from a closed position on a valve seat wherein the bottom faces primarily downward when the water closet is full, toward an open valve position wherein the tank ball bottom faces more horizontally and is less buoyant to close only when the water level drops to a predetermined low level wherein the water closet is primarily but not completely empty, the improvement for use when the water tank has a limited capacity and the toilet bowl does not completely flush, comprising:

attaching a closing delay cup device which includes a cup with a drainage hole, to said tank ball, so the cup lies on a horizontal side of said axis opposite said seat when the valve member is open and lies on the same side of said axis as said seat when the valve member is closed, said drainage hole being small enough that most of the water lying in said water closet between said predetermined low level and the level of said valve seat drains out through said seat before said cup is light enough to allow said valve member to close, said flush valve being pivotally mounted and attached to the chain device independently of said closing delay cup device, whereby to enable use of a reliable valve and to minimize water consumption when the valve has been installed in a large tank, while enabling complete flushing when the valve has been installed in a small tank.

4,907,303

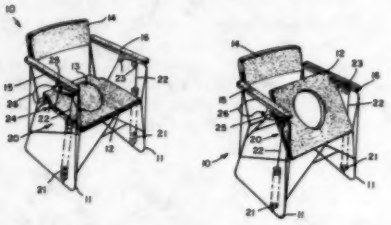
ORTHOPEDIC CHAIR

Lincoln F. Baird, 3482 Moore St., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 781,134, Sep. 26, 1985. This application May 19, 1987, Ser. No. 52,602

Int. Cl.[4] A47C *1/02*; A47K *11/06*; A61G *7/02*

U.S. Cl. 4—480 **8 Claims**



1. An orthopedic chair comprising:

a. a frame;

b. a seat which is pivotally coupled to said frame at the front thereof;

c. a back which is mechanically coupled to said frame;

d. a pair of arm-rests which are mechanically coupled to said frame;

e. a pair of a springs each of which has a first end which is mechanically coupled to the base of said frame;

f. a pair of cables the first end of each of which is mechanically coupled to a second end of one of said springs;

g. a pair of pulley systems, each of which includes two pulleys which are disposed in series and mechanically coupled to said frame above said seat and through each of which the second end of one of said cables is threaded and wherein the second end of each of said cables is securably coupled to said seat whereby said springs resiliently bias said seat, when it is in its first position, toward its second position so that said seat may be used to assist an invalid to easily sit therein; and

h. releasing means for releasing said seat so that said cables moves said seat from its first position to its second position.

7. An orthopedic chair according to claim 1 or 3 wherein said seat has a center hole so that an invalid may use said the orthopedic chair in conjunction with a toilet and wherein said orthopedic chair also comprises a cover-plate which covers said center hole of said seat so that the invalid may use said orthopedic chair for other activities.

4,907,304

LAMINAR FLOW APPARATUS

Peter Davidson, 27308 Pacific Coast Hwy., Malibu, Calif. 90265, and S. Gretchen Buck, 8242 W. Third St., Los Angeles, Calif. 90048

Filed Mar. 9, 1988, Ser. No. 165,803

Int. Cl.[4] E04H *3/18*

U.S. Cl. 4—488 **1 Claim**

1. In an apparatus for generating a laminar flow in a reservoir containing water, the improvement which comprises:

a pair of spaced apertures in one of the walls surrounding and defining said reservoir, with both such apertures being disposed beneath the surface of the water therein;

said apertures providing an upper opening nearest the surface of the water in said reservoir and a lower opening nearest the bottom of said reservoir;

said flow generating means including a flow conduit connecting said upper and lower openings;

flow generating means disposed adjacent to said reservoir and communicating through said openings with the water in said reservoir;

said flow conduit including an upper section aligned with and extending outwardly from said upper opening, said upper section being substantially parallel to the surface of the water in said reservoir;

said flow conduit further including a lower section extending outwardly from said lower opening, said lower section being disposed angularly upwardly;

said flow conduit further including arcuately curved intermediate section interconnecting said upper and lower sections;

said flow generating means further including flow diffusing means with said flow conduit;

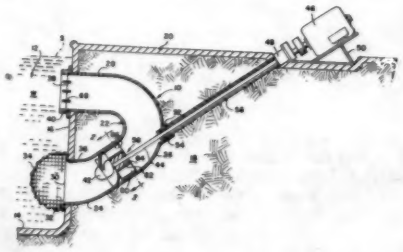
said flow generating means further including impeller means disposed within said lower section of said flow conduit;

said flow diffusing means including a first and a second set of vane members;

said first set of vane members being disposed in said lower section between said impeller means and said intermediate section;

said first set of vane members extending radially of said lower section to form a separate series of adjacent flow passages;

said second set of vane members being disposed in said upper section adjacent said upper opening;



said second set of vane members being disposed parallel to the surface of the water in said reservoir;

drive motor means;

means operatively connecting said drive motor means with said impeller means whereby operation of said drive motor means rotates said impeller means and thereby draws water from said reservoir through said lower opening;

said operation of said impeller means further causing said water drawn in through said lower opening to pass through said lower section to and through first set of vane members and said series of adjacent flow passages formed thereby to thus laminarize the flow characteristics of the water;

said operation of said impeller means further causing said water to discharge from said flow passages, to pass through said intermediate section and said upper section, and to pass across said second set of vane members and discharge into said reservoir through said upper opening as non-turbulent laminar flow.

4,907,305

BUBBLING BATHTUB SYSTEM

Keiichi Teramachi; Harue Kawagoe; Naoki Kumon; Shinya Hirota; Hidehiko Kishie; Tsutomu Amaki, and Haruhige Tsusaka, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 6, 1988, Ser. No. 240,329

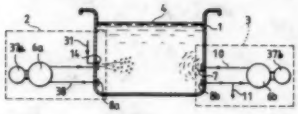
Claims priority, application Japan, Sep. 4, 1987, 62-136083; Sep. 4, 1987, 62-136084

Int. Cl.[4] A61H *33/02*; E03C *1/02*

U.S. Cl. 4—542 **11 Claims**

1. A bubbling bathtub system comprising: a bathtub; large bubble generating means for blowing relatively large bubbles into said bathtub; and minute bubble generating means for

dissolving air in bath water by pressurization and introducing said bath water with air dissolved therein into said bathtub to produce minute bubbles therein, said minute bubble generating means comprising a pump, an inlet pipe connecting an outlet of said bathtub to an inlet of said pump, an air suction device connection to said inlet pipe between said outlet of said bathtub and said inlet of said pump, air-water, separating means connected between an outlet of said pump and an inlet of said



bathtub for discharging excess air undissolved in the bath water introduced into said bathtub by said minute bubble generating means, the amount of air dissolved in said bath water by pressurization by said pump being sufficiently great that when said bath water from said minute bubble generating means is introduced into said bathtub and is therein immediately depressurized, air dissolved therein is educed to form minute bubbles in the bath water in said bathtub.

4,907,306

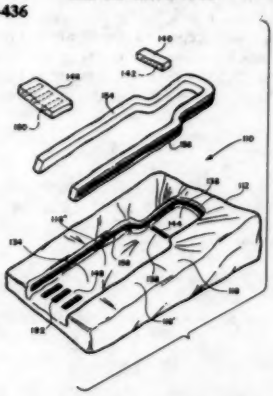
SUPINE SUPPORT DEVICE AND METHOD FOR TREATMENT AND PREVENTION OF MALOCCLUSION OF THE TEETH

Norman K. Nakaji, 2440 Statesville Blvd., Salisbury, N.C. 28144

Continuation-in-part of Ser. No. 115,694, Nov. 2, 1987, abandoned. This application May 16, 1988, Ser. No. 194,398

Int. Cl.[4] A47G *9/00*

U.S. Cl. 5—436 **12 Claims**



1. A pillow for the therapeutic treatment and prevention of malocclusion of the teeth, characterized in that said pillow constrains a user to lie in a supine position during sleeping, resting and similar periods of general activity, said pillow comprising a generally wedge-shaped main body adapted for supporting a user's torso and head when supine, said main body having a lower surface for resting disposition on a generally horizontal support surface suitable for sleeping and resting such as a mattress, bed or the like and a cushioned upper surface extending at an acute angle with respect to said lower surface for disposition at an upward incline with respect to horizontal, said upper surface being formed with a relatively elevated marginal region bordering a relatively recessed user support region having a torso support area, a head support area and a cervical support area intermediate said torso and head support areas relatively elevated therefrom, said user support region generally conforming in shape to the human torso and head to enable a user to comfortably lie supine with the user's torso and head within said recessed torso and head support areas with said elevated marginal region acting to resist any tendency of the user to turn from the supine position and with said cervical support area providing cervical support to the user's neck, said main body having a first substantially wedge-shaped body member for forming said lower surface, a second substantially planar body member secured in superposed relation to said first body member for forming said user support region, a third substantially planar body member secured in superposed relation to said second body member and having an opening formed therethrough in the general shape of the human torso and head for forming said elevated marginal region and defining said recessed user support region, and a fourth body member secured in superposed relation to said second body member intermediate said torso and head support areas of said user support region for forming said cervical support area, thereby promoting natural development of the occlusion of the user's teeth by deterring the user from sleeping and resting in prone and sidewise positions wherein the user's jaws may assume an unnatural relationship.

4,907,307

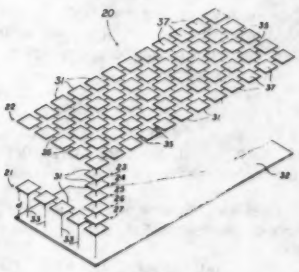
SUPPORT STRUCTURE

David A. Weitzler, 25 Fraser Rd., Framingham, Mass. 01701

Filed Mar. 2, 1988, Ser. No. 163,031

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—449 **17 Claims**



1. A support structure for use with a fluid medium and comprising:

a base means for disposition in a given position;

a first buoy means and a second buoy means each comprising an array of buoy portions each buoyant in the fluid medium and connector means connecting adjacent buoy portions in said array, said first buoy means adapted to be supported by the fluid medium in another position displaced from said given position, said second buoy means adapted to be supported by the fluid medium in a different position displaced from both said given and another positions, and said connector means being adapted to permit relative movement between said adjacent buoy portions in direction, substantially normal thereto while maintaining certain maximum spacings therebetween in directions transverse to said normal directions;

anchor means securing said base means to said first buoy means and adapted to permit closure movement therebetween and to maintain a given maximum displacement therebetween; and

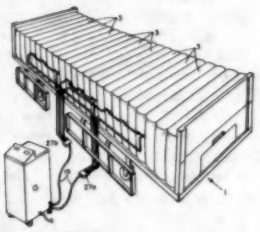
mooring means securing said first buoy means to said second buoy means, said mooring means adapted to maintain a predetermined maximum spacing between said first and second buoy means and to permit relative closure movement therebetween.

4,907,308

HEAT EXCHANGE SYSTEM FOR INFLATABLE PATIENT SUPPORT APPLIANCES

Peter A. Leininger, San Antonio, Tex., and Mohamad A. Hajianpour, Miami, Fla., assignors to Kinetic Concepts, Inc., San Antonio, Tex.

Filed Nov. 21, 1988, Ser. No. 274,273
Int. Cl.[4] A47C *27/10*; A47G *7/04*
U.S. Cl. 5—455 7 Claims



1. A generally elongate inflatable cushion for use with a plurality of similar cushions in inflatable patient support appliances in conjunction with heat exchange tubing, comprising:

a top patient support surface, two side walls, two end walls, a bottom, and an air inlet nipple; and

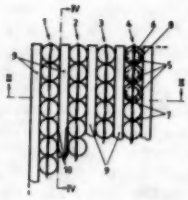
a pouch formed in one of the end walls and connected to each of the opposite side walls within the cushion but not extending to the opposite end wall, said pouch being located between the top patient support surface and the bottom of the cushion and being adapted to removably retain heat exchange tubing.

4,907,309

POCKET-SPRING CORE MATTRESS

Andreas Breckle, Am Waldrand 8, 3410 Northeim, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,017
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1987, 3728148
Int. Cl.[4] A47C *27/05*
U.S. Cl. 5—477 6 Claims



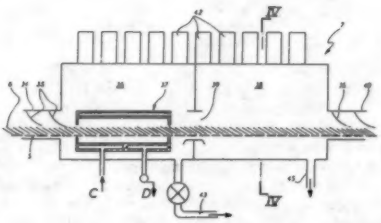
1. A pocket-spring core mattress assembly comprising a plurality of interconnected, encased helical springs, each of said springs having a closed pocket of fabric, plastic or the like disposed therearound, said closed pockets being connected to one another to form elongated bands in a first longitudinal direction, said bands having a top, bottom, and opposed sides, a plurality of elastomeric, independent, connecting walls, said walls having a top, bottom, and opposed sides, said walls disposed between said bands in alternating relationship, and adhesive means disposed between the sides of said walls and said bands for indirectly bonding said bands together in a transverse direction relative to the direction of said bands.

4,907,310

INSTALLATION FOR THE CONTINUOUS PROCESSING OF AT LEAST ONE TEXTILE YARN

Robert Enderlin, Morschwiller-Le-Bas, France, assignor to Superba, S.A., Mulhouse Cedex, France

PCT No. PCT/FR87/00066, § 371 Date Aug. 25, 1988, § 102(e) Date Aug. 25, 1988, PCT Pub. No. WO87/05640, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 11, 1987, Ser. No. 251,703
Claims priority, application France, Mar. 14, 1986, 86 03791
Int. Cl.[4] D06M *13/34*
U.S. Cl. 8—149.2 10 Claims



10. A continuous drying process of textile yarns resting freely on a gas permeable conveyor belt, which comprises circulating said conveyor supporting the yarns across a washing or dyeing container maintained substantially at atmospheric pressure, exposing the yarns to microwaves or high frequencies causing a heating of the water contained in the yarns, while performing forced ventilation across the yarns and the conveyor belt, and wherein, in an initial zone of the path of the conveyor belt in the enclosure for heating the yarns, one suppresses the forced ventilation and one maintains an elevated humidity level around the yarns by means of a micro-wave or high frequencies permeable heated sheath, surrounding the conveyor and the yarns supported by it.

4,907,311

SHOE TREE

Wayne Scott, Rt. 1, Box 48, Saunemin, Ill. 61769

Filed Jun. 2, 1988, Ser. No. 201,768
Int. Cl.[4] A43D *5/00*
U.S. Cl. 12—120.5 7 Claims

1. A shoe tree applied to the exterior of a shoe, boot or other article of footwear comprising:

a base;

a toe grip formed on said base adapted to grip and hold the toe of the footwear in place relative to said base,

a heel grip adapted to grip the heel of the footwear,

a generally vertically extending post on said base upon which said heel grip is received and is vertically movable thereon, and

a roughened exterior formed on said post, said post having a longitudinal axis and a diameter, and a bore formed through said heel grip defined by a bore wall, said bore having a longitudinal axis and being sufficiently larger in

diameter than said diameter of said post to permit said heel grip to tip with said bore axis thereby skewed relative to said post axis, portions of said bore wall being frictionally engaged with said post roughened exterior under the natural base of a flexed footwear sole to fix said heel grip in place and thereby straighten the sole.

4,907,312

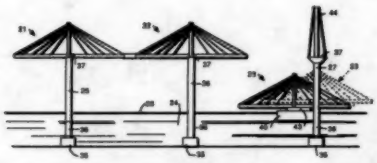
BRIDGE AND METHOD OF INSTALLING PREFABRICATED BRIDGES AND BRIDGE STRUCTURE

Y. C. Yang, San Francisco, and Philip Y. Chow, Orinda, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Filed Dec. 16, 1988, Ser. No. 285,079

Int. Cl.[4] E01D *11/00*

U.S. Cl. 14—21 **13 Claims**



1. A method of constructing a bridge over water, comprising

positioning a bridge span longitudinally in a position through a lengthwise slot in a bridge pier,

moving the span laterally through the slot to a position in the center of the pier at low level,

hoisting the span up to its correct position.

4,907,313

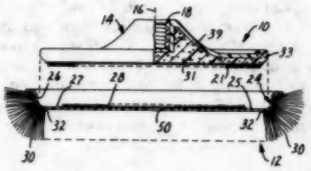
SELF CENTERING BUFFING PAD WITH LOW TEMPERATURE TUFT BONDING ADHESIVE

David C. Roeker, and Ronald L. Ott, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 180,726, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 894,577, Aug. 8, 1986, abandoned. This application Nov. 29, 1988, Ser. No. 277,511

Int. Cl.[4] B24D *13/14*

U.S. Cl. 15—98 **4 Claims**



1. A buff adapted for self centering engagement with a backup pad comprising a circular body of a predetermined diameter adapted to be rotated about its axis by a drive motor, having a generally planar circular coaxial face surface, and a first fastener portion on said face surface, said buff comprising:

a stiff flexible backing having a generally planar circular central portion and an annular flange integral and coaxial with said central portion projecting from one side surface of said central portion, said flange having an inner diameter only slightly larger than the diameter of said backup pad,

a second fastener portion on said one side surface of said central portion adapted for engagement with the fastener portion on a said backup pad; and

a multiplicity of tufts having central portions engaged in said backing and distal end portions projecting from the side of said backing opposite said one side along said central portion and said flange.

4,907,314

PIPELINE PIG

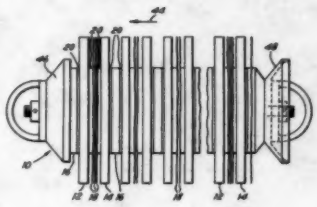
Christopher F. Kershaw, Chesterfield, United Kingdom, assignor to British Pipeline Agency Ltd., et al., Hertfordshire, United Kingdom

Filed Jun. 2, 1988, Ser. No. 201,687

Claims priority, application United Kingdom, Jun. 4, 1987, 8713071

Int. Cl.[4] B08B *9/02*

U.S. Cl. 15—104.061 **13 Claims**



1. In a fluid transportation pipeline having a flexible signal transmitting cable or line deployed therein, a pig which comprises:

(a) a central shaft;

(b) a plurality of similar disc-shaped, radial bristle brushes carried transversely at axially-spaced positions on said central shaft;

(c) a plurality of circular, planar diaphragms of a woven fabric material carried transversely on said central shaft and disposed between and spaced from selected brushes;

(d) means for securing said brushes and diaphragms on said central shaft; and

(e) a resilient conical deflector member secured on said central shaft at its leading end, said deflector member having a peripheral rim portion disposed adjacent to and facing peripheral parts of the foremost brush, and said deflector member being arranged and adapted to sweep aside said cable at any position in said pipeline where said cable crosses the path of said pig.

4,907,315

WIPER ARM OF WINDSHIELD WIPER

Masaru Arai, and Itsuro Saita, both of Saitama, Japan, assignors to Nippon Wiperblade Co., Ltd., Saitama, Japan

Filed Dec. 6, 1988, Ser. No. 280,724

Claims priority, application Japan, Dec. 11, 1987, 62-187830[U]

Int. Cl.[4] A47L *1/00*; B60S *1/34*

U.S. Cl. 15—250.19 **3 Claims**

1. A wiper arm device comprising; a rotatable arm head adapted to be connected to a wiper motor, a wiper blade supporting retainer, a hinge pin rockingly connecting said retainer to said arm head for pivoting movement between a normal condition and a rock back condition, a spring having one end connected to said retainer, a roller pin to which the other end of said spring is connected, a link supporting said roller pin, a

pivot shaft mounted on said arm head and around which said link is rockable, said arm head having a groove therein, and a pin displacable in said groove when said rtainer is pivoted toward the normal condition for forcibly displacing said link from the rock back condition toward the normal condition.

4,907,316

DEVICE FOR DISINFECTING ROOMS AND FLOOR COVERINGS

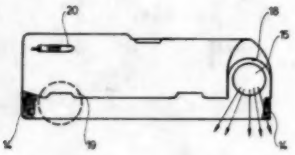
Gerhard Kurz, Stuttgart, Fed. Rep. of Germany, assignor to Interlava AG, Lugano, Switzerland

Filed Jan. 30, 1989, Ser. No. 302,949

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803825

Int. Cl.[4] A47L *9/28*

U.S. Cl. 15—319 **12 Claims**



1. A vacuum cleaner for simultaneous cleaning and disinfection of rooms and the contents thereof, comprising at least one radiator emitting an ultraviolet radiation having disinfecting effect, said at least one ultraviolet radiator being installed in a suction nozzle of the vacuum cleaner, the radiation emitted by said ultraviolet radiator being directed upon the changing areas being worked by said suction nozzle, and a movement sensor in said suction nozzle, said sensor switching off said ultraviolet radiator when said nozzle is not moved for a time exceeding a predetermined period of time.

4,907,317

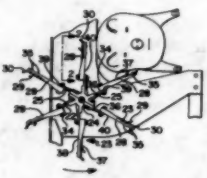
HOG SCRAPER PADDLE

Milorad Radovic, 12364 27 Mile Rd., Washington, Mich. 48094; John Mirkovich, 2531 Lakeshore Rd., Applegate, Mich. 48401, and Boja J. Loncarski, 2790 Mayfair, Troy, Mich. 48084

Filed Nov. 9, 1988, Ser. No. 269,080

Int. Cl.[4] A22B *5/08*

U.S. Cl. 17—16 **21 Claims**



1. A hog scraper paddle for dehairing and polishing hog carcasses and the like, comprising:

a resiliently flexible paddle body having a tapering body thickness wherein the body is substantially thicker at one end than the other, said paddle body being made of an easy-to-clean, substantially non-porous thermoplastic material having a softening temperature endotherm peak greater than about 350° F. and flexural modulus values between about 100 and 6,000 psi and about 30,000 and 150,000 psi;

mounting means for securing the paddle body to a dehairing machine;

said paddle body including openings therein for receiving the mounting means to secure the paddle body to the dehairing machine; and

at least one scraper blade attached to the paddle body for dehairing a carcass.

4,907,318

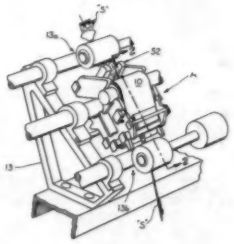
SLIVER CONTROL DRAFTING CRADLE

Donald L. Sieroslawski, Rte. 7, Box 209, Piedmont, S.C. 29673, and Luther W. Cranford, 1038 E. Perry Rd., Greenville, S.C. 29609

Filed Aug. 30, 1988, Ser. No. 238,192

Int. Cl.[4] D01H *5/86, 5/88*

U.S. Cl. 19—255 **21 Claims**



1. An apron drafting system for drafting a textile sliver and the like comprising:

an upper apron and a lower apron between which said silver is drafted;

mounting means for mounting said upper apron generally above said lower apron and for rotating said upper and lower aprons to cause drafting of said sliver in a first direction;

said upper apron having a first run and a second run between a top roll and a top apron guide about which said upper apron travels, said lower apron having a first run and a second run between a bottom roll and a bottom apron guide about which said bottom apron travels, said first run of said upper apron and said first run of said lower apron coextending generally face to face in a fiber delivery contact relation; and

fiber control means disposed adjacent said first run of said upper apron and said first run of said lower apron for controlling the amount of deflection of said aprons in a direction generally normal to said first runs to allow said aprons to deflect by a first amount within a prescribed range and limiting apron deflection beyond said prescribed range to allow passage of large slubs and the like and to maintain positive control over said sliver drafted.

4,907,319

METAL CLAMP

Lionel Calmettes, and Michel Andre, both of Romorantin Lanthenay, France, assignors to Etablissements Caillau, Issyles-Moulineaux, France

Continuation of Ser. No. 205,816, Jun. 13, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 395,190

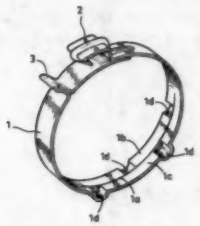
Claims priority, application France, Jun. 22, 1987, 87 08725

Int. Cl.[4] B65D *63/02*

U.S. Cl. 24—20 R **1 Claim**

1. In a clamp constituted by a metal band wound on itself, comprising complementary tightening and/or joining means in the vicinity of each of its ends, the band presents, in a zone preferably remote from said ends, a longitudinal slit thus defining two band sections, parallel with respect to each other and being in contact at respective longitudinal edges formed by the slit, and, on each of said band sections is provided at least one

corrugation projecting outwardly of the clamp, each corrugation of one of the band sections being offset circumferentially



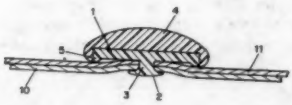
with respect to each corrugation of the other band section, the metal band having a constant width over its entire length.

4,907,320

DETACHABLE DROP-OFF-PROOF BUTTON

Ting Miao, Flat No. 24, 741 Julu Lu, Shanghai, China

Filed Nov. 30, 1987, Ser. No. 126,580
Int. Cl.[4] A44B *1/18*
U.S. Cl. 24—101 R **10 Claims**



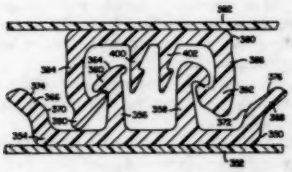
1. A drop-off-proof button configured so as to not be thread sewn to an article of clothing and capable of being buttoned into and unbuttoned from a button head and a connecting stud; the main button head having a basically flat lower surface with a peripheral flange projecting towards the auxiliary button-head; the stud configured so as to connect the inner surfaces of the main and auxiliary button heads and to intersect the main and auxiliary heads at approximately 90 degrees; the stud further configured in a cylindrical shape; wherein the diameter of the main head is significantly larger than the diameter of the auxiliary head which is significantly larger than the diameter of the stud; the auxiliary head having a flat inner surface, a convexed downward lower surface and a relatively thin perimeter.

4,907,321

ENHANCED COLOR CHANGE INTERLOCKING CLOSURE STRIP

John W. Williams, Oak Lawn, Ill., assignor to First Brands Corporation, Danbury, Conn.

Continuation of Ser. No. 64,959, Jun. 22, 1987, Pat. No. 4,829,641. This application Jan. 31, 1989, Ser. No. 304,165
Int. Cl.[4] B65D *77/10*
U.S. Cl. 24—587 **14 Claims**



1. In an interlocking closure device including male and female closure elements arranged to be interlocked over a predetermined length, each of said closure elements having different colors for establishing visually the completeness of the occlusion of the closure elements by providing a color different from the closure elements when said closure elements are occluded wherein at least one of the closure elements is translucent, wherein the improvement comprises the introduction of a translucent color change enhancement member, having an index of refraction, in the internal channel of a translucent closure element wherein said color change enhancement member is effective in improving the perceivable color change between said male and female closure elements having different colors and the different color formed by occlusion of the differently colored male and female closure elements and wherein said translucent color change enhancement member comprises at least one member selected from the group consisting of:

(1) a generally right triangle-shaped translucent color change enhancement member:

(2) a generally isoceles triangle-shaped translucent color change enhancement member; and

(3) a translucent color change enhancement member comprising two generally stacked and overlapping triangle-shaped translucent color members.

4,907,322

ADORNMENT DEVICE

Kiyohiro Kanno, Dai-Ni Ofuna Park Town C-613, 521, Kasamacho, Sakae-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Apr. 6, 1988, Ser. No. 178,358
Claims priority, application Japan, Apr. 6, 1987, 62-50991
Int. Cl.[4] A44C *11/00*; A44B *11/25*
U.S. Cl. 24—616 **11 Claims**

1. An adornment device comprising:

a flexible cord having a plurality of thin wires as a core and an outer cord coating for covering said plurality of thin wires, the outer coating being formed of a flexible, soft-resilient material so as to reduce frictional contact from the cord and to enhance securing of the cord;

a retainer having a cord-threading hole through which said cord is inserted once before a clasp and through which said cord is looped back after being bent at a bending point; and

a releasable securing means for engaging the outer cord coating, said cord being securable at said retainer by said securing means while adjustment of the tension of said cord is being made.

4,907,323

METHOD AND APPARATUS FOR MAKING BIASED FABRIC

Donald L. Smith; Curtis L. McDonald, and Jim R. Hicks, all of Seguin, Tex., assignors to Hexcel Corporation, Dublin, Calif.

Filed Mar. 15, 1988, Ser. No. 168,294
Int. Cl.[4] B21D *43/00*
U.S. Cl. 29—2.21 **40 Claims**

1. A method of producing a fabric in which the structural fibers are skewed relative to the fabric centerline, comprising the steps of:

transporting in a first linear direction a tube of fabric in which the structural fibers are oriented either generally parallel or generally perpendicular to the longitudinal axis of the tube;

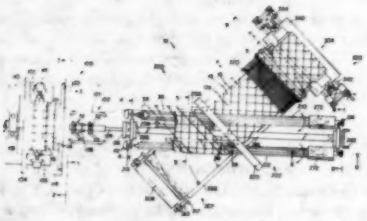
axially rotating the tube as the tube is transported in the first direction;

said transporting and rotating steps being performed with a roll means to prevent any significant linear or axial force from being exerted on the fabric;

slitting the tube at an angle skewed to the first direction as the tube rotates and moves in the first direction to produce a flat, strip of fabric in which the structural fibers are skewed relative to the centerline of the strip of fabric.

33. A system adapted for processing a woven tube of unbiased fabric to produce a flat strip of biased fabric, in which the structural fibers are oriented at a skewed angle to the fabric marginal edges, the system comprising:

a fabric feeding station having means for holding a roll of said tube of unbiased fabric, said holding means being operable for permitting fabric take-off in a first linear direction and for rotating said tube of fabric as it moves in said first linear direction;



a fabric slitting station disposed proximate the feeding station in the first direction including

roll means for engaging the inside of the tube of fabric to transport the fabric linearly in the first direction and simultaneously rotate the tube of fabric,

cutting means disposed beneath the roll means for slitting the tube of fabric at an acute angle in a helix around the tube of fabric to produce a strip of biased fabric in which the structural fibers are oriented at a skewed angle relative to the longitudinal edges of the strip of fabric, and

support means disposed beneath said roll means and extending outwardly therefrom in a second direction for supporting the strip of fabric for movement in the second direction; and

a fabric winding station disposed proximate said slitting station in said second direction, including a mandrel for rolling up the strip of fabric.

4,907,324

CONNECTOR TERMINATION APPARATUS AND METHOD

Hasmukh Shah, Wheaton; Henry Zielke, Hoffman Estates; Richard L. Patterson, Riverside, and Thomas P. Pellegrino, Lisle, all of Ill., assignors to Molex Incorporated

Filed Sep. 7, 1988, Ser. No. 241,286

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—33 M **14 Claims**

1. Apparatus for terminating wires using a reciprocating drive member to move wires from a wire feed region into insulation displacement connectors, the connections including a housing with multiple side by side cavities, a plurality of terminals in the cavities and insulation displacement slots in the terminals, said apparatus comprising:

a wire termination tool mounted on the drive member for movement along a termination path intersecting the wire feed region in response to movement of the reciprocating drive member; and

connector feed means for advancing one of the connectors to position the slot of the terminal to be terminated in said termination path;

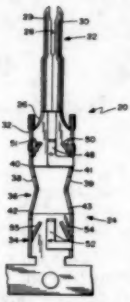
said termination tool being movable in a termination stroke from an initial position into the terminal slot and in a return stroke to said initial position;

said terminating apparatus being characterized by:

a support member;

means mounting said support member on the drive member;

a connection locating member carried by said support member; and



a wire guide template located in said termination path between the wire region and the slot;

said connector locating member being spaced from said termination tool and engaging the connector during said termination stroke prior to movement of said termination tool into the slot.

4,907,325

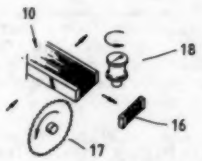
BLIND TRIMMER

Pei H. Hsu, No. 373 Sec 4, Yen Hai Rd., Fu Nan Fu Shing, Chang Hua, Taiwan, Taiwan

Filed Aug. 9, 1988, Ser. No. 230,143

Int. Cl.[4] B23P *23/00;* **B23C** *3/00*

U.S. Cl. 29—33 P **10 Claims**



1. A blind trimmer comprising:

a machine frame having thereon a first longitudinal slideway;

a first trimming mechanism immovably fixed on a longitudinal side of said frame; and

a second trimming mechanism movably mounted on said slideway at an opposite longitudinal side of said frame so that a distance between said first and second trimming mechanisms can be adjusted; and wherein each of said trimming mechanisms include:

a plate mounted on said frame and having thereon a second longitudinal slideway perpendicular to said first longitudinal slideway;

a saw capable of sawing in a direction parallel to said second slideway and mounted on said plate outside of said second slideway; and

a clamping device including:

a slide piece slidable on said second slideway; and two jaw members spacedly mounted on said slide piece and

capable of clamping therebetween a respective end portion of a collapsed blind so that said respective end portion will be trimmed by said saw when said slide piece is slid on said second slideway to let said respective end portion pass through said saw.

4,907,326

SYSTEM FOR MANIPULATION OF SMALL-DIAMETER PIPES AND A PROCESSING DEVICE FOR VEHICULAR BRAKE, FUEL AND HYDRAULIC LINES

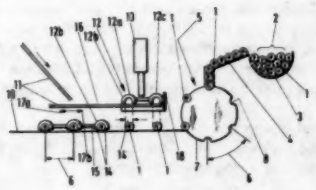
Hans-Ulrich Dietzel, St. Leon-Rot; Gernot Dolch, Heidelberg, and Walter Müffke, Wiesenbach, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,082

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701556

Int. Cl.[4] B23Q 7/16; B23P 23/00

U.S. Cl. 29—33 T 16 Claims



1. Device for processing of small-diameter pipes, in particular of pipes with bulges disposed or to be disposed at their ends comprising

transport means for feeding a plurality of loose pipes; a separating device with separating elements coordinated to the transport means for receiving loose pipes from the transport means for separating the loose pipes perpendicular to the longitudinal axis of the plurality of loose pipes, a separating means for pipes fed by teh transport means where the separating means includes separating elements set for fixed separation distances between the pipes; transport means for cyclically moving the fixed distance separated pipes from said separating means to a hinge assembling location;

a feed device disposed above the separated pipes for furnishing disengageable hinged members;

a press-in device disposed above the separated pipes for receiving the plurality of again disengageable hinged members and for pressing the disengageable hinged members around respective pipes for formation of a pipe mat.

8. Device for manipulation of small-diameter pipes, in particular of pipes with bulges disposed or to be disposed at their ends, the improvement comprising a receiving station a bundle (2) of loose pipes (1); means for feeding pipes to an individualizing or separating device (5) with separating elements (8) follows, perpendicular to the longitudinal axis (1a) of the bundle (2), which separating elements (8) are set for fixed separation distances (6) between the pipes; transport means for cyclically moving the fixed distance separated pipes from said separating means to a hinge assembling location; at least one feed device (11) and one press-in device (13) above the separated pipes (1) and for a plurality of engageable and again disengageable hinged members (12) around said fixed distance separated pipes for formation of a pipe mat (19).

4,907,327

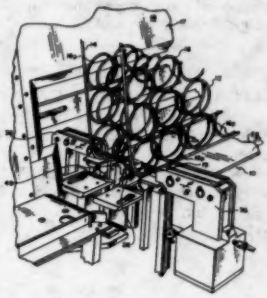
DEVICE FOR AUTOMATICALLY SECURING A BORDERWIRE ON A MATTRESS INNERSPRING

Donald B. Ayres, 4708-C Main St., Skokie, Ill. 60076, and Mark A. Forsthoff, 1221 West Clarendon Rd., Arlington Heights, Ill. 60004

Filed Jun. 1, 1989, Ser. No. 360,127

Int. Cl.[4] B68G 7/00

U.S. Cl. 29—91 8 Claims



1. A device for automatically securing a borderwire on a mattress innerspring, said mattress innerspring comprising a plurality of coils including perimeter coils located along a perimeter of said innerspring the device comprising:

a tool for sequentially joining segments of said borderwire to said perimeter coils;

means for advancing said mattress innerspring and borderwire toward said tool;

an element for sequentially contacting each of said perimeter coils;

a sensor for detecting contact of said element with said perimeter coils; and

means responsive to said detection for actuating said tool.

4,907,328

METHOD OF MAKING PIECES OF FURNITURE FROM SHEETS OF FELT TREATED WITH HARDENING SUBSTANCES

Gaetano Pesce, Paris, France, assignor to Cassina S.p.A., Milan, Italy

Filed Aug. 31, 1988, Ser. No. 239,215

Claims priority, application Italy, Sep. 8, 1987, 21841 A/87

Int. Cl.[4] B68G 7/02

U.S. Cl. 29—91.1 8 Claims

1. A method of making an article of furniture having a predetermined three-dimensional shape, comprising the steps of:

(a) cutting a piece of fabric out of a web of a generally soft and pliable fabric in a pattern corresponding to a developed shape of an article of furniture to be made and pro-

viding the cutout piece of fabric, prior to imparting to it said predetermined shape, with a thermally activatable hardening substance;

(b) shaping the cutout piece of fabric to a three-dimensional shape corresponding to the predetermined shape of said article of furniture; and

(c) thermally activating said substance only at selected parts of the piece of fabric in said three-dimensional shape to rigidify said parts and render said three-dimensional shape of said piece of fabric fully self-supporting, while leaving other parts of said three-dimensional shape of said piece of fabric unrigidified and soft and pliable.

4,907,329

AXIAL SUPPORT DEVICE FOR A CYLINDER WITH ROTATING SLEEVE

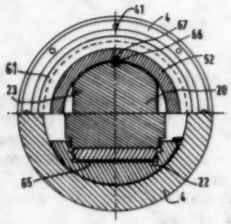
Dominique Boulot, St Gratien, France, assignor to Clecim, Courbevoie, France

Filed Jun. 6, 1988, Ser. No. 202,867

Claims priority, application France, Jun. 4, 1987, 87 07823

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—116.2 **7 Claims**



1. Axial support device for a roll with rotating sleeve, said device comprising

(a) a fixed shaft (2) in the form of an elongated beam carried at each end (20) by a support member (3) in a fixed frame (1);

(b) a tubular cylindrical sleeve (4) slipped onto said shaft (2) and mounted for rotation about an axis of rotation (60);

(c) a series of aligned holding shoes (22) inserted between said shaft (2) and said sleeve (4) and each associated with a thrust means for adjustment of a profile of said sleeve (4);

(d) a bearing (6) at each end of said sleeve for centering said sleeve on said shaft about said axis of rotation, each said bearing comprising an outer ring (62) which is solid in rotation with said sleeve (4) and an inner ring (61) locked in rotation;

(e) each centering bearing (6) being arranged so as to contain axial thrusts and resting axially on said support member (3) by means of a floating support device which is capable of exerting uniformly distributed axial pressure on said inner ring (61) of said bearing (6) by following angular offsets of said axis of rotation (60) of the bearing (6) with respect to an axis (25) of a corresponding end (20) of said shaft (2), which offsets result from respective deformations of said sleeve and of said shaft under the influence of stresses applied during operation;

(f) said floating support device of each bearing (6) comprising a plurality of thrusters (5) distributed regularly about said axis (25) of a corresponding end of said shaft and mounted for sliding movement parallel to said axis inside a bush (31) slipped onto said end (20) of said shaft (2) and forming a part of said support member (3), each thruster (5) resting on said inner ring (61) of said bearing (6) with a possibility of axial displacement parallel to said axis of said corresponding end of said shaft, said thrusters being hydraulically actuated under a same common pressure.

4,907,330

SINTERED BODY ASSEMBLY FORMED FROM A PLURALITY OF INDEPENDENT COMPACTS AND METHOD OF PRODUCING SAME

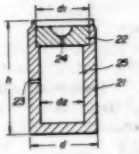
Shigeaki Akao; Masakatu Hayakawa, and Mitsuyoshi Kawamura, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 6, 1988, Ser. No. 202,295

Claims priority, application Japan, Jun. 4, 1987, 62-138882; Aug. 31, 1987, 62-132330[U]; Dec. 17, 1987, 62-317383

Int. Cl.[4] B21K *1/20*; B23P *15/02*

U.S. Cl. 123—90.51 **27 Claims**



1. A method of producing a sintered body assembly comprising:

preparing an inner compact corresponding to an inner section of the sintered body assembly and having a predetermined shrinkage percentage at the time of sintering;

preparing an outer compact corresponding to an outer section of the sintered body assembly and having a shrinkage percentage at the time of sintering larger than that of said inner compact;

fitting said inner compact in said outer compact; and

subjecting said inner and outer compacts to sintering and allowing same into an integral unit.

4,907,331

MECHANISM FOR DETACHING AN AUTOMOBILE DOOR

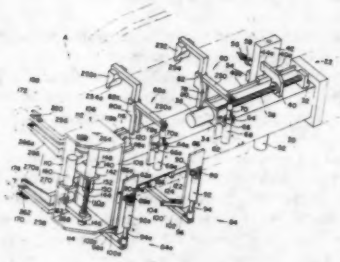
Shigeo Kaibuki; Shinpei Watanabe; Mitsugu Takahashi, and Hiroshi Moriya, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 73,589, Jul. 15, 1987. This application Feb. 2, 1989, Ser. No. 305,512

Claims priority, application Japan, Jul. 15, 1986, 61-167360; Jul. 15, 1986, 61-167362; Apr. 22, 1987, 62-100777

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—213.1 **8 Claims**



1. A mechanism for detaching a door which is attached to an automobile body with a hinge pin engaging a hinge member on the automobile body and a hinge member on the door, said mechanism comprising:

(a) an arm displaceable with respect to at least the door;

(b) holder means for holding the door on said arm;

(c) positioning means for engaging the hinge member on the door to position said holder means; and

(d) remover means for removing said hinge pin from said hinge members.

4,907,332

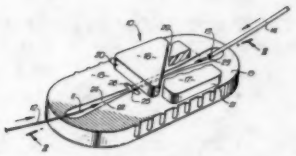
DEVICE FOR CONNECTING EXTENDABLE GUIDEWIRE SECTIONS FOR CARDIOVASCULAR PROCEDURES

Jeffrey J. Christain, San Jose; Ross Gould, Berkeley, and Isidro Gandionco, Fremont, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jan. 11, 1988, Ser. No. 142,070

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—237 **8 Claims**



1. A device for vascular procedures to facilitate the interconnection of a first elongated hollow member having an open female end and a second elongated hollow member having a male end comprising:

(a) a body member having an upper portion with an elongated guiding groove therein having first and second groove sections, said groove sections tapering inwardly toward a location where said sections intersect, one of the sections adapted to slidably receive the female end of the first elongated member and the second section adapted to slidably receive the male end of the second elongated member, said groove sections cooperating to guide the female end and the male end into engagement; and

(b) two flexible tabs longitudinally spaced along guiding grooves with one tab secured to the upper portion of the body member at one end thereof on one side of the guiding groove and extending over the elongated guiding groove and a second tab secured to the upper portion of the body member at one end thereof on the other side of the guiding groove section and extending over said elongated guiding groove to hold an end of the elongated members within the grooves.

4,907,333

DEVICE FOR ACCURATELY POSITIONING AND ALIGNING A GUIDE SLEEVE INTO A BORE OF A CYLINDER HEAD

Peter H. Dawe, 215 Springbrook, Sparta, N.J. 07871

Filed Aug. 23, 1988, Ser. No. 235,687

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—251 **3 Claims**

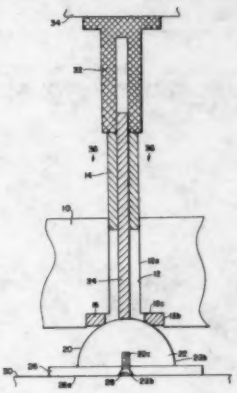
1. For use with a cylinder head having a plurality of bores, a guide sleeve received tightly in each bore , a valve having a valve head and a valve stem insertable through each guide sleeve, and a valve seat for seating each valve head, a device for accurately positioning and automatically aligning correctly each guide sleeve within a respective bore, comprising:

(a) a base section having

(i) a positioning surface for positioning said device on a support surface;

(ii) an upper aligning surface having an arcuate section for accurately automatically aligning said valve seat thereon during forcible insertion of said guide sleeve into the respective bore; and

(b) a guide rod secured to said upper aligning surface for insertion into said respective bore for automatically accu-



rately guiding said guide sleeve which is force fit into the respective bore.

4,907,334

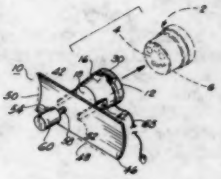
SHIELD FOR ELECTRIC METER PULLER

Terry Carver, 610 S. Julia St., Poplarville, Miss. 39470

Filed Nov. 8, 1988, Ser. No. 268,842

Int. Cl.[4] B25B *27/14*

U.S. Cl. 29—278 **5 Claims**



1. An apparatus for the safe removal of a glass enclosed electrical power device comprising:

a. cylindrical shield means having a first generally opening receiving end and a second, shielded protected end;

b. means within said shield means for clamping a cylindrical object;

c. means for exerting a linear outward pull upon said shield further comprising:

i. a circular, flexible band having a midpoint and two end points;

ii. said midpoint being affixed at a point on the interior of said shield means;

iii. said end points extending through a provided opening of said shield means diametrically opposite said midpoint; and

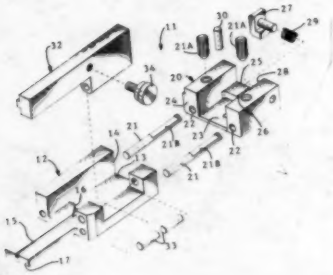
iv. means for tightening said end points in a direction towards each other.

4,907,335

TOOL FOR ASSEMBLING OPTICAL FIBER

Walter A. Egner, Oberlin; Ronald R. Schaffer, Harrisburg; Larry R. Stauffer, Camp Hill, and Gary N. Warner, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 20, 1988, Ser. No. 209,257
Int. Cl.[4] B23Q *3/02*; B23P *19/04*
U.S. Cl. 29—283.5 **10 Claims**



1. Apparatus for inserting an optical fiber in a connector, for imparting a bend in the fiber and for applying an axial force to the fiber, thereby to apply pressure between corresponding, abutting optical faces of the fiber and an optical device mounted on the connector, the apparatus including;

a base,

a passage in the base receiving an optical fiber for movement therein, and for aligning the optical fiber with and optical device mounted to a connector,

first means connected on the base for biasing the fiber and for imparting a bend in the fiber out of straight alignment with the passage in the base,

second means adjacent the first means for allowing unrestricted bending of the fiber by said first means,

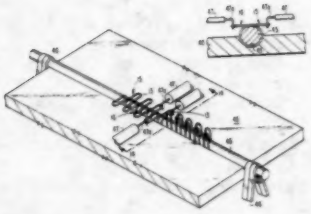
and a third means for clamping the fiber, the third means being displaceable for displacing the fiber axially of its length and along a connector and toward an optical device mounted to such a connector.

4,907,336

METHOD OF MAKING AN ENDOVASCULAR STENT AND DELIVERY SYSTEM

Cesare Gianturco, Champaign, Ill., assignor to Cook Incorporated, Bloomington, Ind.

Division of Ser. No. 25,736, Mar. 13, 1987, Pat. No. 4,800,882.
This application Sep. 9, 1988, Ser. No. 242,334
Int. Cl.[4] B21D *39/00*; B23P *11/00*
U.S. Cl. 29—515 **3 Claims**



1. A method for making a stent comprising the steps of:

(a) forming a wire into a planar serpentine configuration having a series of alternating opposing loops, each with a closed end;

(b) placing said wire on a flat surface having a trough with a semi-cylindrical wall, said wire being situated over said trough such that said serpentine configuration is generally centered over said trough;

(c) using a cylindrical tool, forcing said wire into said trough between said cylindrical tool and said semi-cylindrical wall; and

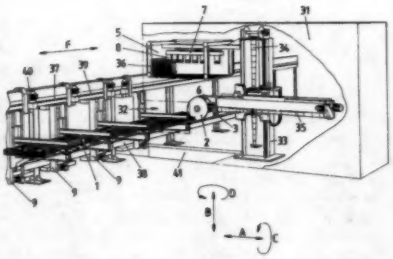
(d) forcing said opposing loops over said cylindrical tool to form said wire into a generally cylindrical shape having a longitudinal axis, such that said loops lie longitudinally adjacent each other.

4,907,337

APPARATUS FOR MACHINING A WORKPIECE OF WOOD, IN PARTICULAR WOOD BEAMS

Fritz Krüsi, Dorf, CH-9105 Schönengrund, Switzerland

Filed Nov. 3, 1987, Ser. No. 116,081
Claims priority, application Switzerland, Nov. 4, 1986, 4354/86
Int. Cl.[4] B23Q *3/157, 3/00*; B27C *9/02*
U.S. Cl. 29—568 **4 Claims**



1. Apparatus for machining a workpiece of wood, in particular wood beams, comprising a transport means for clamping and displacing the workpiece along a feed path, and at least one tool drivable by a drive means, wherein the drive means with the tool is arranged displaceably in a forward region of the feed path of the transport means, and is fixed to a cantilever arm which is displaceable in a plane transversely with respect to the forward feed direction of the transport means in vertical and horizontal directions, and the drive means is also rotatable about the axis of the arm and about an axis transverse with respect to the axis of the arm, means are provided for displacing said cantilever arm in said vertical and horizontal directions and for rotating said drive means about said axis, the drive means has a tool holding means for selectively accommodating different tools, a tool magazine having a plurality of tools is arranged above the region of operation of the tool, and the drive means is displaceable into the tool magazine for receiving or delivering a tool.

4,907,338

SUPERCONDUCTING JOINT FOR SUPERCONDUCTING WIRES AND COILS AND METHOD OF FORMING

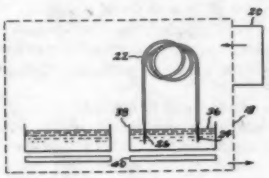
Roy F. Thornton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 853,794, Apr. 18, 1986, Pat. No. 4,744,506.
This application Dec. 21, 1987, Ser. No. 135,859
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] H01L *39/24*
U.S. Cl. 29—599 **21 Claims**

18. A superconducting coil comprising a coil of at least one turn of superconducting wire,

said wire having multiple fine filaments of superconductor extending lengthwire through an elongated matrix metal,

said coil having at least one wire to wire joint,
said joint containing filaments of said superconductor released from said matrix metal,



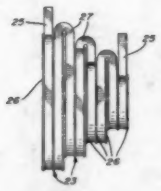
the released superconductor filaments of each wire being embedded in the same solidified body of superconducting solder metal.

4,907,339

METHOD OF CONSTRUCTION OF A DISTRIBUTION TRANSFORMER HAVING A COILED MAGNETIC CIRCUIT

Nicolai Alexandrov, St-Bruno-de-Montarville, Canada, assignor to Hydro-Quebec, Montreal, Canada

Division of Ser. No. 3,367, Jan. 14, 1987, abandoned, which is a continuation of Ser. No. 632,065, Jul. 18, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 94,807
Int. Cl.[4] H01F *41/06*
U.S. Cl. 29—605 **6 Claims**



1. A method of constructing a distribution transformer of the type having a magnetic circuit in the form of one or more hollow coils and having primary and secondary windings extending through the interior of the magnetic circuit, said method comprising the steps of:

(i) forming primary and secondary windings by winding a flat electrically insulated conductor to form a pair of single flat coils each in the form of a pancake, said pancakes being wound in opposed directions to one another and forming a cross-over junction at the interior of the windings so that the terminal end of each winding lies on the outer periphery of the pancakes and the two windings lie in parallel planes and form a double pancake;

(ii) interposing flat insulating sheet material between and to each side of adjacent coils;

(iii) inserting cooling means in association with the primary and secondary coil windings and molding a solid insulating material about said windings, said cooling means and said sheet material to form a rigid support frame thereabout; and

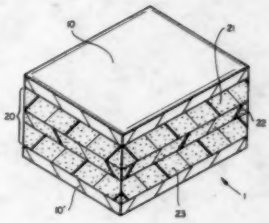
(iv) coiling a ferro-magnetic steel ribbon about at least one leg of said support containing the primary and secondary windings to thereby form said magnetic circuit.

4,907,340

ELECTRICAL DEVICE COMPRISING CONDUCTIVE POLYMERS

Shou-Mean Fang, Union City, and Charles H. Camphouse, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 30, 1987, Ser. No. 102,987
Int. Cl.[4] H01C *17/00*; H01B *1/04*
U.S. Cl. 29—610.1 **4 Claims**



1. A process for the preparation of an electrical device which comprises

(1) a PTC element composed of a cross-linked conductive polymer composition which exhibits PTC behavior and which comprises a polymeric component and, dispersed in the polymeric component, a particulate conductive filler; and

(2) two electrodes which are electrically connected to the PTC element and which are connectable to a source of electrical power to cause current to pass through the PTC element,

which process comprises subjecting the PTC element to radiation cross-linking in which (i) said cross-linking is achieved by use of an electron beam and (ii) the average dose rate is at most 3.0 Mrad/minute.

4,907,341

COMPOUND RESISTOR MANUFACTURING METHOD

Roy W. Chapel, Jr., Edmonds, and David N. Duperon, Lake Stevens, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

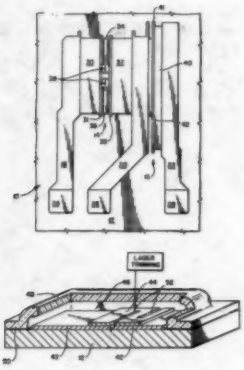
Division of Ser. No. 19,669, Feb. 27, 1987, Pat. No. 4,803,457. This application Dec. 31, 1987, Ser. No. 140,294
Int. Cl.[4] H01C *7/02, 7/04*
U.S. Cl. 29—612 **9 Claims**

1. A method for making a compound resistor, comprising the steps of:

forming a first portion of said compound resistor with a first resistance and a first temperature coefficient of resistance;

forming a second portion of said compound resistor with a second resistance and a second temperature coefficient of resistance, said second resistance different in magnitude from said first resistance and said second temperature coefficient of resistance different from and opposite in

direction from said first temperature coefficient of resistance; and



removing portions of one of said first and second portions until the composite temperature coefficient of resistance of said first and second portions is substantially zero.

4,907,342

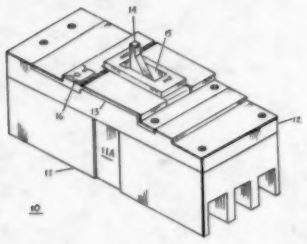
METHOD OF ASSEMBLING A MOLDED CASE CIRCUIT BREAKER CURRENT TRANSFORMER ASSEMBLY

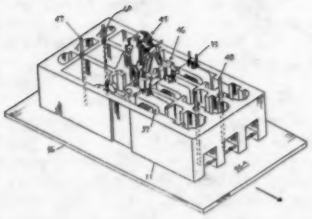
Roger N. Castonguay, Terryville; Joseph M. Palmieri, Southington, and Graham A. Scott, Avon, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 299,179, Jan. 18, 1989. This application Jul. 31, 1989, Ser. No. 386,760

Int. Cl.[4] H01H *11/00*

U.S. Cl. 29—622 **1 Claim**





1. A method of assembling a molded case circuit interrupter comprising the steps of:

providing a support member having a plurality of upstanding posts;

arranging a corresponding plurality of passages through a molded plastic circuit interrupter case over said posts and capturing said posts within said passages;

inserting an operating mechanism within said case;

inserting a plurality of current transformers within said case said transformers each including a pair of upstanding pin connectors;

arranging a molded plastic circuit interrupter cover over said case and capturing said posts within passages through said cover and assembling said cover on said case whereby said pin connectors extend through tapered openings formed through said cover in a predetermined location;

arranging a printed wire board containing an electronic trip circuit within said cover whereby a plurality of openings through said printed wire board capture said pin connectors;

connecting said pin connectors with corresponding pins on said printed wire board to electrically interconnect said transformers and said electronic trip circuit; and

attaching an accessory cover to said circuit interrupter cover to enclose said printed wire board.

4,907,343

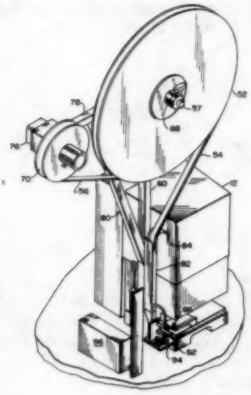
TERMINAL DEREELING APPARATUS

Jerome Dolan, West Dundee; Christopher Wanha, Naperville, and Steven F. Wright, Glen Ellyn, all of Ill., assignors to Molex Incorporated

Filed Mar. 8, 1989, Ser. No. 320,343

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—707 **10 Claims**



1. A terminal dereeling apparatus for delivering a carrier strip with terminals integral therewith into a terminating press, said carrier strip being wound onto a terminal reel with an interleaf material disposed intermediate adjacent layers of the carrier strip on the terminal reel, said terminal dereeling apparatus comprising:

terminal reel mounting means in proximity to the terminating press for rotatably receiving the terminal reel thereon including a rotatable shaft onto which said terminal reel is rotatably mountable and a back plate aligned generally orthogonal to the rotatable shaft, a pressure plate surrounding the rotatable shaft, said pressure plate being movable relative to said back plate, spring means intermediate said back plate and said pressure plate for urging said pressure plate away from said back plate, whereby said pressure plate is operative to exert a predetermined pres-

sure against the terminal reel mounted on the rotatable shaft;

take-up means in proximity to said terminal reel mounting means for taking up the interleaf material unwound from said terminal reel; and

terminal sensing means in proximity to said terminating press for sensing the presence of terminals on the carrier strip, said sensing means being operative to interrupt the terminating press in response to selected sensed patterns of terminals as said carrier strip is delivered to said terminating press.

4,907,344

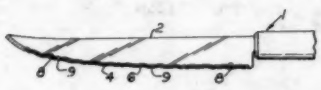
KNIVES

Jerome S. Hahn, Boca Raton, Fla., assignor to Richardson Sheffield Limited, Sheffield, England

Filed Feb. 22, 1988, Ser. No. 162,797

Int. Cl.[4] B26B *9/02*

U.S. Cl. 30—355 **17 Claims**



1. A knife comprising a blade in the form of a parallel sided blank, a centrally located V-shaped cutting edge on said blank having a first side that is flat ground, formulations being ground into a second side of said v-shaped cutting edge to assist cutting action, and interruptions to said formulations being provided in spaced relationship along the length of the cutting edge to group said formulations into discrete lengths the groups of formations being of greater length than the interruptions, and said interruptions each having a cutting edge and being such as to maintain a continuous cutting edge along the length of the blade.

4,907,345

APPARATUS FOR CHECKING DIAMETRAL DIMENSIONS OF MECHANICAL PIECES

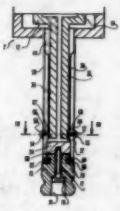
Carlo Dall'aglio, Volta Reno di Argelato; Franco Danielli, Zola Predosa, and Guido Golinelli, Bologna, all of Italy, assignors to Marposs Societá per Azioni, S. Marino di Bentivoglio, Italy

Filed May 9, 1988, Ser. No. 191,348

Claims priority, application Italy, May 27, 1987, 3492 A/87

Int. Cl.[4] G01B *3/46, 7/28*

U.S. Cl. 33—544.3 **29 Claims**



1. An apparatus for checking diametral dimensions of a mechanical piece, with support means, two reciprocally movable feelers for contacting the piece, transducer means for providing a signal depending on the mutual distance of the feelers, transmission means arranged between the feelers and the transducer means, and protection means for preventing the entry of foreign matter, the protection means including a resilient substantially tubular element defining a longitudinal axis and a lateral surface, the feelers being fastened to said lateral surfaces, wherein the tubular element is made out of a resilient lamina having substantially constant thickness, the material and the geometrical dimensions of the tubular element being chosen so as to have, substantially, stiffness with respect to axial and torsional stresses, resilient compliance in transversal radial direction, and resistance to impacts and wear at least three orders of magnitude greater than those of similar elements made of natural or synthetic rubber.

4,907,346

TERRESTRIAL MAGNETIC SENSOR

Yasuaki Watanabe, Koide, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,169

Claims priority, application Japan, Mar. 10, 1987, 62-35500[U]

Int. Cl.[4] G01C *17/28*

U.S. Cl. 33—361 **8 Claims**

1. A terrestrial magnetic sensor comprising:

a bobbin body having a magnetic core inserting groove,

a silicon gel filled in the magnetic core inserting groove,

a magnetic core buried in the silicon gel filled in the magnetic core inserting groove, and

a bobbin cover for closing the magnetic core inserting groove of the bobbin body.

4,907,347

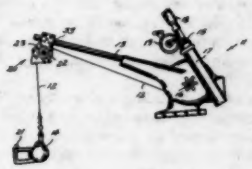
SWIVEL HEAD COUNTER

Eugene D. Pease, Muskegon, Mich., assignor to S & K Products, Inc. A Division of Armstrong International, Muskegon, Mich.

Filed Jan. 23, 1989, Ser. No. 300,046

Int. Cl.[4] G01B *5/18*

U.S. Cl. 33—720 **5 Claims**



1. A swivel head counter comprising:

a pair of side plates operably confining therebetween a gear

train, a pulley, including an axle extension portion of said pulley having a radially slotted spur protuberance, sleeve bearings supporting said axles in said plates, a swivel sleeve and key way providing a symetrical, cylindrical enclosure with an axis transverse to the axis of said axle, said side plates including locator pins and pin receiving recesses, and plural detent means cooperating upon registering closure of said side plates to securely lock said sideplates in operative relation in respect to said gear set, said pulley and said swivel portion;

a wheel knob counter calibrated externally in convenient lineal distance intervals and having an internal circular gear engageable with said gear train extending operably through one of said side plates and said knob operably connected to an axle-like extension of said one of said side plates and said counter secured to said extension in prevention of axial displacement; and

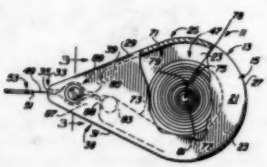
a pointer on said one of said side plates functioning together with said wheel knob counter as a counting indicator of lineal movement of said pulley, whereby counting from 0, a line passing from the swivel head counter is determinable in lineal units to determine an actual depth and upon retrieval of the line returning said counter to 0.

4,907,348

NAVIGATIONAL TAPE MEASURE-TYPE APPARATUS

Elmer A. Hubbard, Jr., P.O. Box 669, Flagstaff, Ariz. 86002

Filed Jun. 27, 1988, Ser. No. 212,336
Int. Cl.[4] G01B *3/10*
U.S. Cl. 33—767 **45 Claims**



1. A distance-measuring navigational aid apparatus comprising:

a housing having a pair of opposing parallel sides. A single unbroken continuous lateral edge portion interconnecting said sides to form a hollow interior therebetween and a slotted opening through one section of said lateral edge portion:

an elongated, relatively thin relative narrow strip of spring steel having a front end portion, a rear end portion. An intermediate portion operably disposed between said end portions, a top surface, and a bottom surface, said elongated strip being self-biased to automatically wind itself into a coil within the hollow interior of said housing, said front end portion extending at least partially through said slotted opening and including stop means for preventing said strip from rewinding completely into the hollow interior of said housing, said stop means being generally coplanar with the plane of said strip for enabling either of said opposing parallel sides of said strip to be laid flat on a chart surface:

graduation means including a plurality of distance-measuring scales operably disposed on each surface of at least the elongated intermediate portion of said strip, said graduation means operably disposed on said top surface of at least the elongated intermediate portion of said strip being calibrated for a first predetermined type of aeronautical chart having a first distance scale and said graduation means operably disposed on said bottom surface of at least the elongated intermediate portion of said strip being calibrated for a second aeronautical chart having a second different and distinct distance scale; and

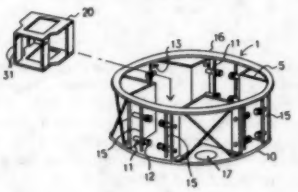
manually-operable push button means being normally biased in a first position for gripping the lateral side edges of said strip and locking same against rewinding back into the hollow interior of said housing, said manually-operable push button means being responsive to the application of manually-applied pressure thereto for shifting said push button means to a second different and distinct position for releasing the lateral side edges of said strip and enabling it to automatically rewind back into the hollow interior of said housing, said push button means being responsive to the outwardly-directed application of manually-applied pulling force to said front end portion of said strip for enabling said strip to be pulled a predetermined desired distance out of said hollow interior of said housing regardless of the position of said push button means.

4,907,349

SPIN DRIER FOR SEMICONDUCTOR MATERIALS

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Jun. 16, 1988, Ser. No. 207,504
Claims priority, application Japan, Jun. 23, 1987, 62-96440[U]
Int. Cl.[4] F26B *17/30*
U.S. Cl. 34—58 **8 Claims**



1. In a spin drier for semiconductor materials, which comprises a casing, a rotor to be rotated in the casing and air guides formed of a curved plate, said air guides mounted on the base plate of the rotor, carriers in which semiconductor materials to be dried are housed being adapted to be set in predetermined areas between the air guides with a cradle in which said carrier is housed, the improvement wherein at each said predetermined area in the rotor at least a pair of opposed holder rods with their free ends adjacent to each other are provided in parallel with the base plate of the rotor and stopper rods are secured perpendicularly to the base plate of the rotor in contact with the holder rod to support a radially outward force applied on the holder rod, each holder rod having a receiver portion in the vicinity of the free end thereof for receiving a leg portion of the carrier housed in the cradle, and also each holder rod being adapted to be engaged with a portion of the cradle in the vicinity of the other secured end of the holder rod, to thereby hold securely both the carrier and the cradle.

4,907,350

SLIPPER SOCK CONSTRUCTION AND METHOD FOR MAKING SAME

Sandy Chilewich, and Kathy Moskal, both of New York, N.Y., assignors to Moskal & Chilewich, Inc., New York, N.Y.

Division of Ser. No. 218,117, Jul. 12, 1988. This application May 30, 1989, Ser. No. 358,899
Int. Cl.[4] A43B *13/28*
U.S. Cl. 36—19 R **11 Claims**

7. A slipper sock construction comprising:

a sock member including an upper portion and a sole portion continuous and integrally formed with said upper portion and having a juncture therebetween;

a sole member having a perimeter and corresponding substantially in shape and dimension to said sole portion of said sock, said sole member being superimposed over said sole portion of said sock member;

at least one continuous stitch running adjacent and substan-

tially through such sole member perimeter and said sock member juncture so as to affix said sole member to said sole portion of said sock member;

wherein said at least one continuous stitch is not externally visible; and

wherein said sole member perimeter is covered over by said sock member so that said perimeter is not exposed inside said slipper sock.

4,907,351

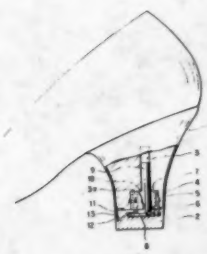
HEEL DEVICE FOR SHOES

Giichi Hirai, No. 2-6, 3-chome, Ichikawa Minami, Ichikawa-shi, Chiba,, Japan

Filed Nov. 29, 1988, Ser. No. 277,663

Int. Cl.[4] A43D *21/36*

U.S. Cl. 36—42 **4 Claims**



1. A heel device for shoes having a heel and a heel lift detachably attached to said heel comprising:

an insertion hole formed from the bottom face of said heel with a large-diameter portion formed in the lower portion thereof and a substantially lateral semicircular cross-section in the upper portion thereof of said heel,

a ring engaged with the large-diameter portion of said insertion hole,

a clamping member having expansible and contractible properties to be engaged within said ring and formed of a material having strong frictional force, and

an inserting rod of the shape corresponding to that of said insertion hole to be inserted into said insertion hole of said heel and stood on said heel lift.

4,907,352

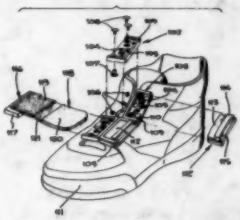
SHOE LACE REPLACING AND SHOE FASTENING DEVICE

Jay Ginsberg, 525 N. Kings Rd., #6, Los Angeles, Calif. 90048

Continuation-in-part of Ser. No. 151,448, Feb. 2, 1988, abandoned. This application Oct. 12, 1988, Ser. No. 256,709

Int. Cl.[4] A43C *11/00, 11/12*

U.S. Cl. 36—50 **4 Claims**



1. A shoe lace replacing and shoe fastening device comprising:

a pair of eyelet members, each of said members having a base plate with a plurality of spaced apertures therein having securing means therein for securing each of said base plates to at least a pair of adjacent spaced eyelets generally aligned with at least two of said apertures along each side of the upper of a shoe, each of said base plates having an upstanding peripheral wall with an inwardly extending flange along the upper surface thereof extending partway about the periphery of each base member forming a slotted opening on one side of each base member, the slotted openings in each of said base members opening outwardly from said shoe in opposite directions; and

an insert member insertible into each slotted opening, one of said insert members having a U-shaped elongated flange on the upper surface thereof forming an opening between the underside of said flange and the upper surface of the base member on which said U-shaped flange is mounted, and the other of said insert members having an elongated strip secured thereto with readily detachable and attachable mating hook and loop portions of material at spaced locations along the upper surface thereof whereby said strip is insertible between said U-shaped flange and the upper surface of the base member to which said U-shaped flange is mounted and foldable about itself and about said U-shaped flange to engage said hook and loop portions.

4,907,353

CROSS-COUNTRY SKI BOOT

Heinz Wittmann; Karl Stritzl, both of Vienna; Franz Luschnig, Traiskirchen; Robert Stanzl, Enzersdorf/Fischa, and Alois Himmetsberger, Vienna, all of Austria, assignors to TMC Corporation, Switzerland

PCT No. PCT/EP87/00695, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/05271, PCT Pub. Date Jul. 28, 1988

PCT Filed Nov. 11, 1987, Ser. No. 230,834

Claims priority, application Australia, Jan. 23, 1987, 129/87

Int. Cl.[4] A43B *5/04;* A63C *9/00*

U.S. Cl. 36—117 **11 Claims**

1. A cross-country ski boot sole having a toe end and heel end, the sole comprising:

a first section including a portion substantially disposed at the toe-end of the sole, the first section formed of hard plastic;

a second section substantially formed of plastic material softer than the first section;

means for connecting the first section and the second section;

hooking means disposed in and extending from the toe end

of said first section for engagement with a cross-country ski binding; and

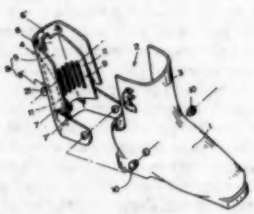
support surface means disposed on the sole for interaction with a cross-country ski binding.

4,907,354

ALPINE SKI BOOTS

Louis Benoit, Frangy, and Bernard Nerrinck, La-Balme-de-Sillingy, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Apr. 7, 1988, Ser. No. 178,579
Claims priority, application France, Apr. 17, 1987, 87 05949
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 **38 Claims**



1. A ski boot comprising an upper, said upper having a rear portion comprising a foot maintenance apparatus, said foot maintenance apparatus comprising a support plate adjacent the internal wall of the rear portion of the upper, said support plate being at least partially affixed to said rear portion of said upper, said support plate having at least one deformation zone in a zone positioned above the heel of the foot being inserted in said boot.

4,907,355

CYCLING SHOE WITH ADJUSTABLE CLEAT SYSTEM

Thomas P. Allen, and Lawrence P. Eisenbach, both of Beaverton, Oreg., assignors to Nike, Inc and Nike International Ltd., both of Beaverton, Oreg.

Filed Jul. 18, 1988, Ser. No. 220,323
Int. Cl.[4] A43B *5/14*
U.S. Cl. 36—131 **20 Claims**

1. A cycling shoe and a convertible and adjustable cleat system comprising:

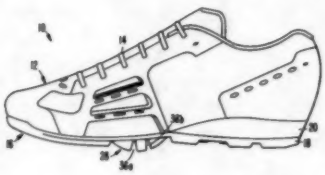
a shoe having an upper and a sole; and

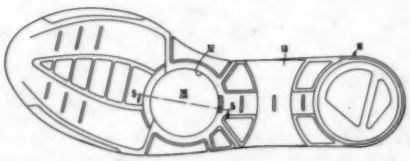
a cleat assembly including a first disc, a second disc, and means for attaching said discs to said sole;

said first removable disc having an inner sole facing surface and an outer ground facing surface, said outer surface being formed of a material markable by contact with a bicycle pedal wherein the outer surface can be left with a mark indicative of the longitudinal and angular pedal position with respect to the shoe sole of the cyclist wearing the shoe;

said second removable disc having an inner sole facing surface and an outer ground facing surface, said second disc outer surface having at least one groove for engaging a pedal of a bicycle;

said attaching means removably attaching, one at a time, said





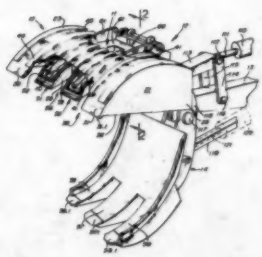
first and second discs to said sole in a plurality of rotational positions wherein said groove of said second cleat is alignable in the angular position with respect to said sole as indicated on the markable material on the outer surface of said first disc.

4,907,356

SLIPPER BUCKET FOR GRAPPLE

Kenneth R. Labounty, Route 1, Box 164B, Two Harbors, Minn. 55616

Filed Jan. 23, 1989, Ser. No. 299,639
Int. Cl.[4] E02F *3/76*; B66C *3/16*
U.S. Cl. 37—117.5 **15 Claims**



1. A scooper bucket attachable to a tined jaw of a grapple on the boom structure of a mobile machine such as a hydraulic excavator comprising

rigid elongate enclosure means having opposite ends and an open front side for accessing the interior of the enclosure means, the enclosure means also having a plate portion defining at least a partial back side opposite said open front side, said plate portion being shaped to extend along portions of the jaw between the distal tip ends of the tines and the proximal inner ends, the plate portion having an edge portion adjacent the open front side for penetrating a mass of particulate to be scooped,

and the enclosure means having a socket for demountably receiving the distal tip end of one tine and also having connector means attachable to the tined jaw adjacent the

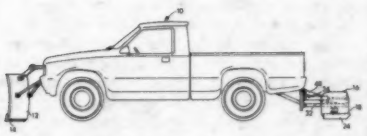
proximal inner end of one of the tines for demountably securing the enclosure means and scooper bucket to the tined jaw.

4,907,357

SNOW PLOW ASSEMBLY ADAPTED FOR MOUNTING ON A VEHICLE AND METHOD OF USING THE SAME

Scott C. Lilienthal, P.O. Box 3232, Vail, Colo. 81658

Filed Feb. 24, 1988, Ser. No. 159,673
Int. Cl.[4] E01H *4/00*
U.S. Cl. 37—197 19 Claims



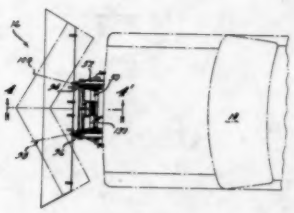
17. A snow plow assembly according to claim 8 wherein said front blade position altering means is operable independently of the operability of said rear blade position altering means.

4,907,358

SNOWBLADE ASSEMBLY

Thomas S. Moore, Northville, Mich., assignor to Detroit Innovative Products, Northville, Mich.

Filed Aug. 23, 1989, Ser. No. 397,544
Int. Cl.[4] E01H *5/06*
U.S. Cl. 37—232 13 Claims



1. A snowblade assembly for attaching a snowblade to a motor vehicle, said motor vehicle traveling over a plurality of ground objects wherein, said snowblade engages said ground objects, said snowblade assembly comprising:

channel means moveable between a planar and a pointed position for mounting said snowblade;

four bar linkage means pivotally connected to said channel means for horizontally extending said channel means from said vehicle and for causing said channel means to pivotally rotate upon said engagement of said ground objects by said snowblade;

winch means, connected to said four bar linkage means, for raising and lowering said channel means; and

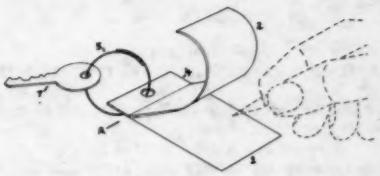
containment means, connected to said vehicle, for partially containing said four bar linkage means and for limiting said raising and lowering of said channel means by said winch means.

4,907,359

KEY IDENTIFICATION TAG

Sidney A. Berman, Woodland Hills, Calif., assignor to Law Printing Company, Inc., Los Angeles, Calif.

Filed Dec. 22, 1987, Ser. No. 136,752
Int. Cl.[4] A44C *3/18*
U.S. Cl. 40—299 3 Claims



1. An identification tag comprising:

a tag having a surface suitable for imprinting;

a flexible, transparent protective sheet that exceeds the tag's dimensions in one axis;

a transparent adhesive means that completely engages a surface of said protective sheet and receives a portion of one edge of said tag;

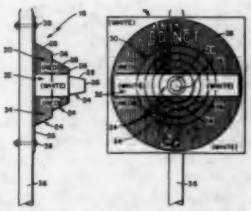
a backing means releasably attached by said adhesive to said protective sheet except in the area received by said portion of one edge of said tag.

4,907,360

THREE-DIMENSIONAL SIGNAGE

William G. MacMunn, 361 Mulpus Rd., Lunenburg, Mass. 01462

Continuation of Ser. No. 79,462, Jul. 30, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,160
Int. Cl.[4] G09F *7/16*
U.S. Cl. 40—552 3 Claims



1. A three-dimensional road sign for providing graphic information over a wide range of angles, comprising:

a planar base member adapted for mounting in a vertical plane;

a three-dimensional member extending outwardly from said base member about an axis extending substantially perpendicular to the plane of said base member, said three-dimensional member having an exterior surface, said exterior surface including at least one disc spaced apart from said base member in a plane parallel to the plane of said base member and at least one conical band joining said at least one disc to said base member, said at least one conical band having a diameter decreasing from said planar base member;

predetermined colors arranged in predetermined zones on said exterior surface of said three-dimensional member and said planar base member, said predetermined zones being vertically separated with said three-dimensional road sign vertically mounted; and wherein

said predetermined colors are red and white, said red color arranged in first and second zones and said white color

arranged in a centered horizontal band intermediate said first and second red zones to provide the graphic information corresponding to the international DO NOT ENTER indicia; and further wherein

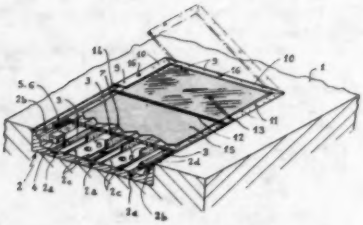
said predetermined red and white colors arranged in said predetermined zones in combination with said three-dimensional member permitting viewing of the DO NOT ENTER graphic information over the wide range of angles.

4,907,361

LUMINOUS PANEL FOR ADVERTISING ON THE GROUND

Jean-Pierre Villard, 19 Rue Phillippe Gonnard, Lyon, France (69001)

Filed Feb. 8, 1988, Ser. No. 153,048
Claims priority, application France, Feb. 18, 1987, 87 02432
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—565 **13 Claims**



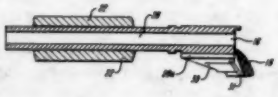
1. An illuminated display device for installation in an opening in a pavement surface comprising a base portion situated within the opening and having a bottom and side walls, said side walls extending upwardly so that the upper edges thereof will be adjacent to the level of the pavement, an inwardly extending peripheral step formed along said side walls and spaced below said upper edges thereof, an electrical light source mounted within said base portion, a fixed frame supported on said peripheral step, a first transparent plate supported on said fixed frame so as to substantially cover the opening, at least one elongated transparent support means disposed within said base portion and extending vertically between said bottom and said first transparent plate intermediate said side walls thereof, means for securing said support means to said bottom, a second frame, means for moveably securing said second frame to said fixed frame, a second transparent plate carried by said second frame, and closure means for selectively securing said second frame to said fixed frame whereby a display may be selectively mounted between said first and second transparent plates and illuminated by said light source.

4,907,362

SUB-CALIBER FIREARM

Edward H. Hobbie, P.O. Box 3, South Deerfield, Mass. 01342

Filed Mar. 8, 1988, Ser. No. 165,532
Int. Cl.[4] F41C *21/00*
U.S. Cl. 42—77 **16 Claims**



1. A sub-caliber automatic pistol of the double-action breech block type including a frame having barrel-mounting ribs, a handle, a barrel-receiving slide with integral breech block, and a firing mechanism of a pistol of a larger caliber and a magazine adapted for storing a plurality of sub-caliber cartridges, said sub-caliber automatic pistol comprising

A. an interchangeable barrel, said barrel having a bore adapted for accommodating said sub-caliber cartridges and terminating rearwardly in a downwardly descending lug having an integral feed ramp defining a first cartridge feed line defining a cartridge path for cartridges of said larger caliber, said barrel being detachable, selectively movable with respect to said frame, and selectively locked in engagement with said slide by barrel ribs integral with said barrel and matable with said barrel-mounting ribs on said frame, said barrel ribs and said barrel-mounting ribs being substantially parallel to a central longitudinal axis of said barrel, said barrel ribs including at least one rib terminating at a first end proximate said feed ramp,

B. Feed spacer means affixed to said barrel lug for defining a second, continuous feed line, said feed spacer means including an upper surface substantially intersecting with a surface of revolution defined by said bore, said second feed line defining a sub-caliber cartridge path which is elevated with respect to said first cartridge path, said second feed line having a selected vertical displacement from a horizontal plane defined by at least one of said barrel ribs,

C. ejector means interconnected to said slide for striking and ejecting a spent sub-caliber cartridge, and

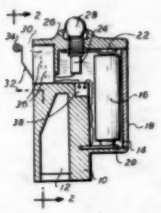
D. extractor means, including a substantially rigid extractor element, for extracting sub-caliber cartridges from said magazine.

4,907,363

WEATHER INSULATED TIP-UP LIGHT MOUNTING

Thomas P. Dury, 136 Park Heights Ave., Dover, N.J. 07801

Filed Sep. 1, 1988, Ser. No. 239,279
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—15 **10 Claims**



1. In combination with a fishing rig including a substantially upright mast and a normally straight resilient strip having one end affixed near the top of said mast and another end releasably secured on said mast at a position to bow said strip, a signal apparatus comprising:

a case having a lower cavity sized to receive the top of said mast to support said case, said case having a lateral cavity sized to receive a storage source of electrical energy;

a pair of battery terminals mounted at opposite ends of said lateral cavity;

an electrical light mounted atop said case; and

a switch means mounted laterally upon said case opposite said lateral cavity and serially connected with said electrical light and said pair of battery terminals, said switch means having:

a pair of electrical contacts; and

a laterally projecting actuator which has biasing means biased towards said resilient strip, said actuator operating said switch means to close and open a circuit with said light and said battery terminals, said actuator being recip-

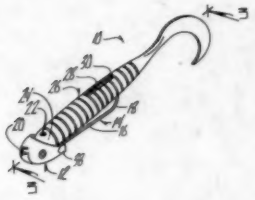
rocatable from a closed to an open position, said actuator being mounted to be electrically isolated from said contacts, said actuator being positioned to engage said resilient strip when it is secured in a bowed position and to open the circuit, said actuator being operable to close the circuit when said resilient strip is released to a substantially straight condition.

4,907,364

WEEDLESS, MULTI-DEPTH SINKING AND TOP WATER FISH LURES

Dean L. R. Hedman, 3302 78th St., Des Moines, Iowa 50322

Filed Jul. 28, 1988, Ser. No. 225,261
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.39 20 Claims



1. A weedless fish lure comprising,

a hook means having a shank portion with forward and rearward ends, a pointed hook portion with a rearwardly disposed barb element connected to the pointed end of said hook portion and the other end of said shank portion having an eyelet connected to said forward end of said shank portion,

a pliable body member having forward and rearward ends with a middle portion therebetween,

retainer means operatively extending rearwardly from the forward end of said body member to detachably secure said forward end of said body member to said shank portion with said hook portion extending into said middle portion of said body member, and

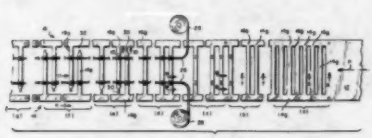
a head element on the forward end of said shank portion and having a rearwardly facing cavity in which said retainer means is positioned and the forward end of said pliable body member is received, said cavity including a bottom wall, opposite side walls and a front wall with said opposite side and bottom walls extending rearwardly along the forward end of said body member.

4,907,365

ELECTROCUTING GRID FOR AN ELECTRONIC INSECT TRAP, AND METHOD OF FABRICATING SAME

Anthony Conigliaro, Jr., Sherborn, Mass., assignor to Armatron International, Inc., Melrose, Mass.

Division of Ser. No. 147,709, Jan. 25, 1988, abandoned. This application Nov. 9, 1988, Ser. No. 270,424
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 4 Claims



2. A method of fabricating an electrocuting grid for an electronic insect trap, said method comprising the steps of:

blanking a strip of electrically conductive sheet material to produce a series of longitudinally spaced laterally extending flat electrodes integrally joined at their opposite ends to first and second carrier members extending along the side edges of said strip;

deforming said flat electrodes into U-shaped cross-sectional configurations;

lancing said electrodes to produce integrally formed bendable tangs aligned in the direction of the length of said strip;

inserting dielectric strand material under said tangs;

clinching said tangs onto said strand material;

severing successive electrodes alternately from said first and second carrier members in order to produce an alternating sequence of first and second electrodes respectively integrally joined to and extending laterally from said first and second carrier members, with the distal ends of said first and second electrodes being spaced respectively from said second and first carrier members, and with the first electrodes and the first carrier member integrally joined thereto being mechanically interconnected to and electrically isolated from the second electrodes and the second carrier member integrally joined thereto by said dielectric strand material to thereby provide a unitary longitudinally extending assembly;

subdividing said assembly into discrete units; and

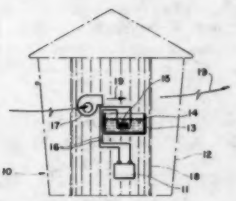
shaping said units into cylindrical grids wherein said carrier members are circular, of the same diameter, arranged concentrically, and spaced axially one from the other to define a cylindrical zone therebetween, and wherein said first and second electrodes respectively extend laterally from said first and second carrier members into said zone.

4,907,366

MOSQUITO CONTROL

Robert S. Balfour, 133 Defense Hwy., Suite 103, Annapolis, Md. 21401

Filed Sep. 27, 1989, Ser. No. 413,284
Int. Cl.[4] A01M *1/02, 13/00*
U.S. Cl. 43—132.1 8 Claims



1. A method of controlling mosquitoes, comprising the steps of heating a lactic acid solution to produce lactic acid molecules, blowing and directing the lactic acid molecules in a direction away from inhabited areas so as to simulate a human being and thereby attracting mosquitoes away from gatherings in backyards and the like.

4,907,367

FLEXIBLE TINE INSECT SWATTER

Stephen Herman, 9341 Hazel Cir., Villa Park, Calif. 92667

Filed Feb. 23, 1989, Ser. No. 315,399
Int. Cl.[4] A01M *3/02*
U.S. Cl. 43—137 11 Claims

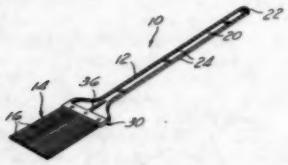
1. An insect swatter, comprising:

a handle;

a first tine set formed from a first unitary piece of material, said first tine set oriented parallel to said handle and having a first tine and a second tine in spaced parallel relationship, and being joined together and fixed with respect to said handle at the end proximate said handle; and

a second tine set formed from a second unitary piece of

material, said second tine set oriented parallel to said handle and having a third tine and a fourth tine in spaced parallel relationship, and being joined together and fixed with respect to said handle at the end proximate said handle such that said tines are interleaved so that the first



tine, third tine, second tine, and fourth tine, respectively, form a substantially contiguous, planar striking surface whereby, due to such a configuration, the first set of tines move independently of the second set of tines thus allowing the swatter to penetrate interstices of irregular surfaces so as to reach insects lurking therein.

4,907,368

STABLE FLUID SYSTEMS FOR PREPARING HIGH DENSITY EXPLOSIVE COMPOSITIONS

John J. Mullay, Hazeltown, and Joseph A. Sohara, Whitehall, both of Pa., assignors to Atlas Powder Company, Dallas, Tex.

Division of Ser. No. 123,865, Nov. 23, 1987, Pat. No. 4,830,637. This application Sep. 15, 1988, Ser. No. 244,321

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 **9 Claims**

1. A thermodynamically stable fluid system that forms an explosive composition when combined with a solid oxidizer, the fluid system comprising the combination of water in the amount of 1–70% by weight of the system, a surfactant in the amount of 5–20% by weight, a cosurfactant in the amount of 0–35% by weight, and an organic oil in the amount of 5–85% by weight, and any droplet formation within the system has a diameter of less than or equal to about 0.1 microns.

4,907,369

MULTI-PURPOSE STAKE

Anton L. Vomfell, 38507 Moravian Dr., Mount Clemens, Mich. 48043

Filed Oct. 22, 1987, Ser. No. 111,250

Int. Cl.[4] A01G *17/14*

U.S. Cl. 47—46 **1 Claim**

1. A multi-purpose stake comprising:

stake means forming a longitudinal member adapted to be supported substantially perpendicular to a support surface;

a longitudinal member being tubular and having a triangular cross-sectional configuration;

said longitudinal member having a bevel-shaped portion at one end to engage the support surface and a closed portion at the other end;

said closed portion comprising a circular flange being of a diameter larger than the cross-sectional area of said longitudinal member;

apertures means forming at least one pair of laterally spaced apertures on said longitudinal member, one of said apertures being on one side of said longitudinal member and the other on an adjacent side of said longitudinal member;

said aperture means comprising a plurality of longitudinally spaced pairs of apertures;

said apertures being elongated longitudinally;

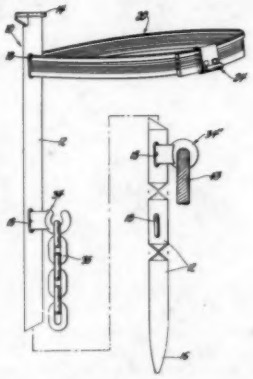
belt means disposed in said pair of said apertures and adapted to form an enclosure to support an object therein;

said belt means comprising a belt being made of a polymer material and having a plurality of laterally spaced and longitudinally extending grooves;

clip means for securing the ends of said belt means together and for allowing the diameter of said enclosure formed by said belt means to be adjusted;

said clip means comprising a spring clip having a first portion being U-shaped and a second portion spaced from said first portion and having at least one end connected to one end of said first portion;

said first and second portions including projections extending inwardly to engage said belt to secure said belt in position therein;



snap-on means for removably engaging said pair of apertures to support an object thereon;

said snap-on means comprising a flexible member having a pair of legs extending outwardly and forming a V-shaped configuration with a flange disposed transversely at one end thereof, said flange engaging said apertures and being disposed therein;

said flexible member including a body portion forming an aperture therein.

4,907,370

GRINDING STONE DRESSING DEVICE

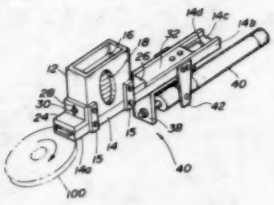
Yutaka Tabata; Toshio Nishikawa, both of Mie, and Hiroshi Sakai, Matsusaka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Sep. 7, 1988, Ser. No. 241,251

Claims priority, application Japan, Mar. 22, 1988, 63-36435[U]

Int. Cl.[4] B24B *53/12*

U.S. Cl. 51—5 D **10 Claims**



10. A window glass grinding device having a pivotal arm on which a circular grinding stone is rotatably mounted;

a dressing device for dressing said circular grinding stone;

a pivot support for mounting said dressing device to said

pivotal arm in a manner to adjust the position of said dressing device relative to said pivotal arm;

said pivot support comprising

a base plate secured to said pivotal arm;

a pivoting arm pivotally connected to said base plate and secured to said dressing device; and

an angular position adjuster for adjusting the angle defined between said base plate and said pivoting arm;

said angular position adjuster comprising

a bolt pivotally connected to a free end of said pivoting arm;

means defining in said base plate an aperture through which said bolt passes; and

at least two nuts engaged with said bolt having the apertured portion of said base plate put therebetween;

said dressing device comprising

a container in which dressing members are contained and piled;

a grooved holding member on which said container is mounted, said holding member including a front portion projected forwardly from a front all of said container and a rear portion projected rearwardly from a rear wall of said container;

means defining in said front and rear walls of said container front and rear openings whose lower peripheries are bounded by a bottom wall of the groove of said grooved holding member, said front opening being so sized as to pass therethrough each of said dressing members;

a pushing plate slidably received in the groove of said rear portion of said holding member, said pushing plate being so sized as to pass through said rear opening; and

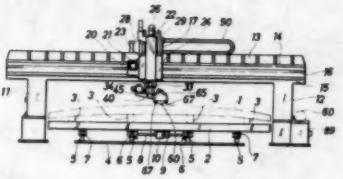
means for reciprocatively moving said pushing plate along said groove between a position wherein a forward end of said pushing plate is deeply inserted into said container through said rear opening and another position wherein said forward end is drawn away from said container.

4,907,371

AUTOMATIC POLISHING MACHINE

Isao Shoda, Shizuoka; Takeshi Fujinawa, and Toshikuni Yazawa, both of Aichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Shoda Iron Works Corporation

Filed Dec. 30, 1988, Ser. No. 291,932
Int. Cl.[4] B24B *7/02*
U.S. Cl. 51—33 R **5 Claims**



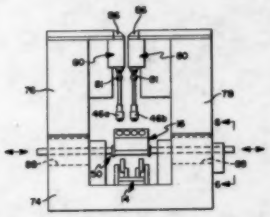
1. An automatic polishing machine, comprising a horizontal beam extending between upper portions of a pair of fixed vertical columns, a movable table for receiving thereon a work to be polished, said movable table being movable in a horizontal direction perpendicular to said beam, a carriage mounted for movement along a horizontal rail on said beam, a carriage driving mechanism including a motor for moving said carriage on said beam, a slider mounted for up and down movement on said carriage, a slider driving mechanism interposed between said carriage and said slider and including a motor for moving said slider up and down on said carriage, a turning member mounted for forward and backward turning movement within a predetermined angular range on an arcuate rail which is located at a lower end portion of said slider and has an upwardly swollen arcuate configuration, a turning member driving mechanism interposed between said turning member and said slider and including a motor for turning said turning member along said arcuate rail, a rocking member mounted for up and down rocking motion on said turning member, a spindle supported for rotation on said rocking member and connected to be rotated by a buffer rotating motor carried on said rocking member, means for oscillating said spindle and a buffer removably mounted on said spindle.

4,907,372

CYLINDER BORE FINISHING APPARATUS TILT FIXTURE

Gerald R. Molitor, Holland, and Richard G. Bidigare, Hamilton, both of Mich., assignors to Micromatic Operations Inc., Holland, Mich.

Filed Oct. 26, 1987, Ser. No. 112,731
Int. Cl.[4] B24B *5/08*
U.S. Cl. 51—38 **25 Claims**



1. In cylinder block finishing apparatus having a series of aligned finishing stations located at spaced points along the transfer line and each of the finishing stations having a servo head for operating a finishing tool and control means for signaling the servo head to selectively position a finishing tool with respect to cylinder bores and to operate the finishing tool within the cylinder bores to remove predetermined stock from the bores the improvement comprising:

means defining a transfer line for carrying a plurality of engine blocks and for moving each of the engine blocks along a predetermined linear path relative to a plurality of finishing stations each having a servo head driven finishing tool;

positioning means located at each of the plurality of finishing stations for positioning an engine block with respect to said finishing tools to align it with the cylinder bores of the engine block operatively positioned at a given one of the plurality of finishing stations;

said positioning means including linear locator means directed transversely of the predetermined linear path for positioning each of a plurality of engine block types in alignment with the finishing tools when the transfer line has positioned an engine block with respect to a selected one of the finishing stations;

said linear locator means having a retracted position to clear said transfer line during movement of the engine blocks along said transfer line for movement with respect to said finishing stations and said linear locator means having an extended position for engagement with an engine block when said transfer line is at rest with respect to said finishing stations;

rotating means located at each of said finishing stations for selectively positioning the engine blocks in accordance with the engine block type presented to each of the finishing stations by the transfer line; and

said control means including means for controlling the operation of the finishing tools at each of the finishing stations to correspond to the positioning of the engine block produced by said rotating means.

4,907,373

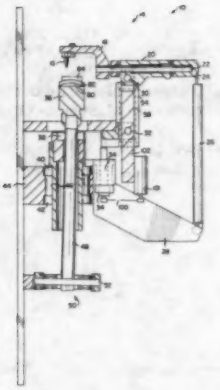
TORIC FINER-POLISHER

Billy D. Hunter, Muskogee, Okla., and Joseph Tusinski, 3401 S. 26th St., Muskogee, Okla.

Filed Oct. 21, 1987, Ser. No. 111,029

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—58 **19 Claims**



1. An apparatus for finishing a toric surface of an ophthalmic lens, comprising:

tool carrying means for carrying a lens finishing tool having a compound curvature and a major tool cylindrical axis, said tool carrying means having a first end at which said tool is disposed and a second end;

lens holding means for holding said ophthalmic lens in contact with said lens finishing tool, said lens having a major lens cylindrical axis;

motor means connected to said lens holding means for driving said tool carrying means in a substantially uniform circular orbital motion to cause said tool to move relative to said toric lens and thereby promote finishing of said surface of said lens;

said motor means being connected to said lens holding means at a location intermediate to said first end and said second end of said tool carrying means; and

gimbal means engaging said tool carrying means at said second end for supporting said tool carrying means at said second end, so as to maximize a gimbal radius of said tool carrying means and enable the substantially uniform circular orbital motion of said finishing tool to have an oscillating excursion stroke less than one inch while maintaining a substantially parallel relationship between the major tool cylindrical axis and the major lens cylindrical axis during finishing of said surface of said lens.

4,907,374

WHEELHEAD FOR GRINDING MACHINES

Jürgen Brill, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

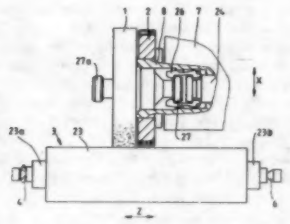
Filed Jul. 22, 1988, Ser. No. 223,780

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724698

Int. Cl.[4] B24B *41/00*

U.S. Cl. 51—168 **10 Claims**

1. A wheelhead for use in grinding and like machines, comprising a rotary spindle; a plurality of material removing wheels coaxial with said spindle; and means for securing said wheels to said spindle, said securing means including means for separably coupling at least one of said wheels to said spindle so that said one wheel can be repeatedly mounted on and detached from the spindle, said coupling means including means



for facilitating automatic mounting of said one wheel on and automatic detachment of said one wheel from said spindle.

4,907,375

GRINDING WHEEL

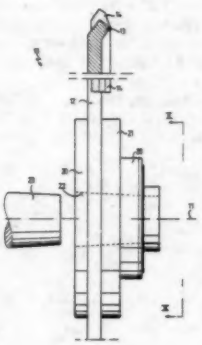
Gunter Weinich, Lorch, and Herbert Setzer, Stuttgart, both of Fed. Rep. of Germany, assignors to Fortuna Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 288,015

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743810; Jul. 12, 1988, 3823591

Int. Cl.[4] B24B *41/04*

U.S. Cl. 51—168 **15 Claims**



1. A grinding wheel comprising:

a rotational disk-shaped body;

a circumferential layer of grinding material arranged on a circumferential rim of said body;

a flange for holding said body and having a central mounting opening for receiving a holding arbor of a grinding machine, said flange having a circumferential surface, said circumferential surface having a radial cross-section of a n-cornered polygon,

centering elements protruding radially from said body and contacting said circumferential surface, said centering elements being circumferentially distributed over said body and being equal in number with the number of corners of said polygon;

means for rotating said circumferential surface relatively to said centering elements.

4,907,376

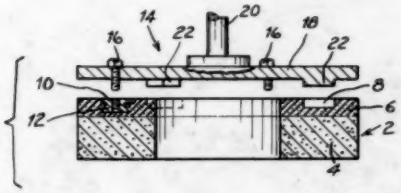
PLATE MOUNTED GRINDING WHEEL

William L. Bouchard, Washington; Charles W. Sudol, and Keith E. Wing, Sr., both of Hillsboro, all of N.H., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 192,423, May 10, 1988, abandoned. This application Oct. 17, 1988, Ser. No. 258,422

Int. Cl.[4] B24D 7/14

U.S. Cl. 51—209 R 12 Claims



1. A grinding wheel made up of abrasive grain and a bond therefore, said wheel having a lower side surface and an upper side surface, said wheel being adapted to grind on its lower side surface with said upper side surface being attachable to a wheel mounting plate, wherein the improvement comprises:

an upper section and a lower section, said lower section constituting a grinding section composed of abrasive grain and a bond therefore, said upper section being composed of particles that are selected from the class consisting of particles that are less abrasive and finer in particle size than the abrasive grain in said lower section, and wherein at least two threaded nuts and at least two depressions of substantial radial dimension are molded into the upper section, said threaded nuts being means for attaching said grinding wheel by bolts which pass through the wheel mounting plate, and said depressions being a means for driving the wheel by mating with matching lugs on the wheel mounting plate.

4,907,377

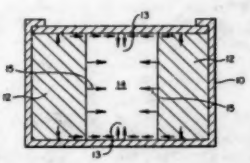
DIRECTIONAL CATALYST ALLOY SWEEP THROUGH PROCESS FOR PREPARING DIAMOND COMPACTS

Frank J. Csillag, Westerville, and Harold P. Bovenkerk, Worthington, both of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Jun. 16, 1988, Ser. No. 207,685

Int. Cl.[4] D24D 3/04

U.S. Cl. 51—309 10 Claims



1. A composite compact comprising a diamond recrystallization catalyst-containing sintered metal carbide support bonded to a polycrystalline diamond compact characterized by diamond-to-diamond bonding resulting from a high pressure/high temperature process wherein a second source of catalyst for diamond recrystallization is selectively diffused through a mass of diamond particles forming said polycrystalline diamond compact, which polycrystalline diamond compact contains catalyst from said second source and substantially no metal catalyst from said carbide support, said catalyst from said second source having a melting point under said high pressure/high temperature conditions which is lower than the melting point of said catalyst in said metal carbide support.

4,907,378

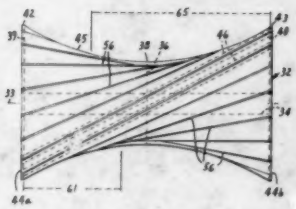
FLAP WHEEL ASSEMBLY

James C. Huppert, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 14, 1988, Ser. No. 270,546

Int. Cl.[4] B24B 9/02

U.S. Cl. 51—330 9 Claims



1. A hub for a flap wheel assembly, said hub having an axis, a central cross section perpendicular to said axis having a generally circular periphery of a first diameter around said axis, opposite circular end cross sections perpendicular to said axis and axially spaced on opposite sides of said central cross section and having circular peripheries around said axis of second diameters substantially larger than the diameter of said central cross section, a peripheral surface comprising a multiplicity of generally straight elongate surface segments extending between the peripheries of said end cross sections across and contacting the periphery of said central cross section each crossing said central cross section at a different radius of said central cross section from said axis and being disposed at the same angle with respect to said axis measured about the radius crossed by the surface segment; said hub having a plurality of straight elongate slots spaced around said periphery, each slot opening through and extending parallel to and along one of said segments between said end cross sections and being larger in cross sectional area at a location spaced from said peripheral surface than adjacent said peripheral surface.

4,907,379

SHOT BLASTING MACHINERY

William R. MacMillan, Altrincham, England, assignor to Tilghman Wheelabrator Ltd., United Kingdom

PCT No. PCT/GB86/00032, § 371 Date Aug. 29, 1986, § 102(e) Date Aug. 29, 1986, PCT Pub. No. WO86/04289, PCT Pub. Date Jul. 31, 1986

Continuation of Ser. No. 921,087, Aug. 29, 1986, abandoned. This PCT application Jan. 17, 1986, Ser. No. 253,313

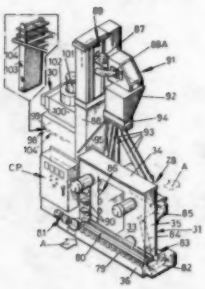
Claims priority, application United Kingdom, Jan. 19, 1985, 85 01386

Int. Cl.[4] B24C 03/14

U.S. Cl. 51—426 18 Claims

1. A shot blasting machine comprising a blast cabinet having first and second opposed walls defining a width joined by third and fourth opposed walls defining a length which define a blasting space for receiving a workpiece to be blasted and, in adjacent and communicating relationship with the blasting space, a space for enclosing an abrasive throwing wheel for use in blasting a workpiece within the blasting space with abrasive, the blasting cabinet including the blasting space and the wheel space having substantially constant cross-sectional dimension along the length and width of the blast cabinet, said wheel space defining the width of the cabinet to be only slightly larger than the width of the abrasive throwing wheel, the first and second opposed walls defining passage means through which a workpiece can be fed into and out of the blasting

space, the abrasive throwing wheel disposed within the wheel space between said first and second walls comprising a single backplate disposed adjacent said first wall and having integral throwing blades surrounding an integral central vaned impellor, a driving motor mounted externally of said first wall and coupled directly to the backplate of the abrasive throwing wheel through said first wall to rotate the abrasive throwing



wheel, a control cage fixedly mounted externally of said second wall which defined an opening through which the control cage projects to surround the vaned impellor of the rotatable abrasive throwing wheel, and abrasive feed delivery means also mounted externally of said second wall and communicated through said opening with the control cage inwardly of said second wall to deliver abrasive thereto and consequently to the vaned impellor of the rotatable abrasive throwing wheel.

4,907,380

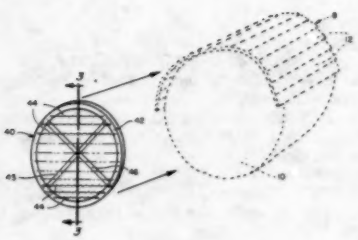
PROTECTION DEVICE FOR BALES

Dennis R. Jannin, Rte. 5, Perryville, Mo. 63775

Continuation-in-part of Ser. No. 364,856, Jun. 12, 1989. This application Jul. 28, 1989, Ser. No. 386,156

Int. Cl.[4] B65D *71/00*

U.S. Cl. 52—4 **6 Claims**



1. A protection device comprising a series of at least two overlapping elongated slats, said elongated slats having at least one projection on at least one side adapted to insure that said protection device will retain at least one air passage between said protection device and product being protected when said protection device is in place to protect said product, and having a flap along one edge of each of said elongated slats adapted to overlap an abutting slat, said elongated slats having means for holding adjacent elongated slats in movable relationship with each other and means for connecting together a series of said elongated slats to form said protection device, said protection device having associated therewith an end panel adapted to prevent animals from feeding from the end of the bale when said protection device is in place.

4,907,381

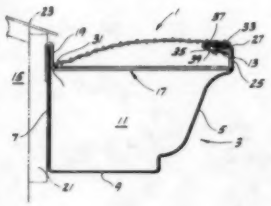
GUTTER SCREEN

James E. Ealer, St. Clair, Mo., assignor to Custon Seamless Guttering, St. Clair, Mo.

Continuation of Ser. No. 877,529, Jun. 23, 1986, abandoned. This application Oct. 28, 1988, Ser. No. 263,703

Int. Cl.[4] E04D *13/00*

U.S. Cl. 52—12 **16 Claims**



1. A gutter screen adapted for covering a gutter and preventing leaves and the like from falling into the gutter, said gutter having front, back and bottom walls and a flange projecting rearwardly from the front wall of the gutter and spaced above the bottom wall of the gutter, said flange extending substantially continuously along the entire length of the gutter, said gutter screen comprising an elongate flexible resilient generally planar non-arcuate screen member having an integral front edge margin bent to form a forwardly-opening channel generally V-shaped in transverse section extending substantially continuously along the entire length of the screen for receiving said gutter flange therein, said channel comprising an upper rearwardly extending portion bent back from the front edge of the screen member and adapted to overlie the gutter flange and engage the gutter flange substantially continuously along substantially the entire length of the gutter screen for supporting the screen on the flange substantially continuously along substantially the entire length of the screen to prevent sagging of the screen, and a lower forwardly extending portion bent forward from the upper rearwardly extending portion and adapted to closely underlie the gutter flange, said upper and lower portions being divergent in the forward direction with respect to the channel to form a relatively wide channel mouth for permitting ready passage of the gutter flange through the channel mouth into a position where the gutter flange is between said upper and lower portions, said screen member further having a rear edge margin adapted for engaging a gutter hanger on the back wall of the gutter, said screen member being adapted to be resiliently bent to an arcuate configuration in which the front edge margin and rear edge margin of the screen member are adapted for pressure engagement with the gutter and gutter hanger thereby securely to maintain the gutter screen on the gutter.

4,907,382

GEODESIC DOME PANEL ASSEMBLY AND METHOD

Paul A. Schwam, P.O. Box 41267, Tucson, Ariz. 85717

Filed Oct. 26, 1987, Ser. No. 112,447

Int. Cl.[4] E04B *1/32*

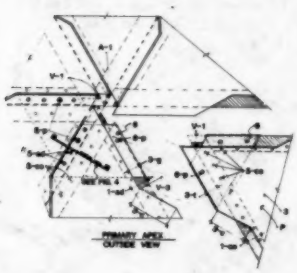
U.S. Cl. 52—81 **7 Claims**

1. A plurality of panels for constructing a multifaced geodesic dome each panel comprising:

(a) a plurality of strut means arranged end to end to define a first polygonal shape, said shape having outer edges substantially identical to one face of said geodesic dome, and

(b) a sheating means secured to said strut means; and having a plurality of edges definding a second polygonal shape which approximates said first shape, each edge of said second polygonal shape having first portions which project beyond said outer edges of said first polygonal shape and second portions which terminate short of said

outer edges; where by when panels are placed adjacent one another to form the faces of said multifaced geodesic dome each panel will have the first portions project across



the outer edges of adjacent panels, which portions may be secured to the strut means of an adjacent panel to form said geodesic dome.

4,907,383

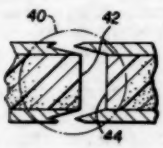
BOWED ROOF STRUCTURE, STRUCTURE PANEL AND METHOD FOR USING SAME

Amos G. Winter, IV, Pinnacle Springs Rd., Spofford, N.H. 03462

Continuation-in-part of Ser. No. 70,065, Jul. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 41,934, Apr. 27, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,685

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—86 13 Claims



1. Prefabricated structural building panels at least some of said panels comprising:

a substantially homogeneous core having substantially uniform thickness bonded to at least one adjacent skin, said skin being of material different from said homogeneous core, said core and said skin in combination having a substantially non-planar shape and first and second pairs of opposed panel edges, said first pair of opposed panel edges being parallel and being substantially non-linear and extending between said second pair of opposed panel edges, said second pair of opposed panel edges being parallel and substantially linear, said at least one adjacent skin further having a first cross sectional area parallel to said first pair of edges and a second cross sectional area parallel to said second pair of edges;

said first pair of opposed and parallel panel edges having an edge configuration adapted to abuttingly interfit first edges of substantially identical panels said edge configuration lying solely in the plane of said at least one adjacent skin having a surface area substantially greater than said first cross sectional area of said skin and being of a character such that when a plurality of said panels are assembled in mating edge to mating edge relationship, tensile and compression forces are transmitted between adjacent panels in the plane of said skins; and

said second pair of opposed, linear and parallel panel edges having an edge configuration adapted to abuttingly interfit second edges of substantially identical panels, said edge configuration lying solely in the plane of said at least one adjacent skin, having a surface area greater than said second cross sectional area of said skin, and being of such a character that when a plurality of said panels are assembled using a fastening means tensile and compressive forces are transmitted between adjacent panels in the plane of said skins.

4,907,384

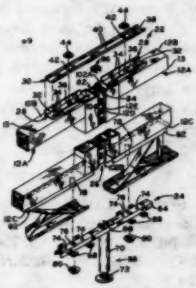
PANEL CONNECTION ARRANGEMENT FOR A PARTITION SYSTEM

Robert A. Underwood, Huntingburg, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jul. 15, 1988, Ser. No. 219,995

Int. Cl.[4] E04B *2/74*

U.S. Cl. 52—126.6 40 Claims



1. In a panel connection apparatus for use in a multi-panel system including at least a pair of panels each having a frame structure with top and bottom edges and opposite side edges, a panel top cap assembly of said panel connection apparatus comprising:

at least one elongated decorative cap member adapted to extend along and overlie adjacent portions of the top edges of the panels;

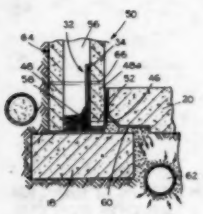
at least one top cap retainer member attached to said decorative cap member;

a connector member adapted for attachment to the pair of panels at the adjacent portions of their top edges so as to span between the panels and rigidly interconnect the panels;

a pair of panel bracket members attached to the adjacent portions of said pair of panels, each of said bracket members including a pair of spaced flanges projecting upwardly, said connector member being received within said spaced flanges of each said bracket member in an interference fit with said spaced flanges; and

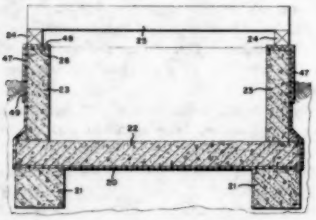
said connector member including an attachment member, one of said attachment and top cap retainer members including means whereby it is capable of resiliently yieldably flexing away from the other of said attachment and top cap retainer members for frictional interfitting of said attachment and retainer members upon installation of said decorative cap member along the top edges of the panels in overlying relation to the panel top edges and said connector member thereon.

4,907,385
DRAINAGE APPARATUS FOR CONCRETE BLOCK WALLS
Richard E. Biodrowski, 3525 No. 58th St., Omaha, Nebr. 68104
Filed Feb. 7, 1989, Ser. No. 307,619
Int. Cl.[4] E02D 31/02
U.S. Cl. 52—169.5 7 Claims



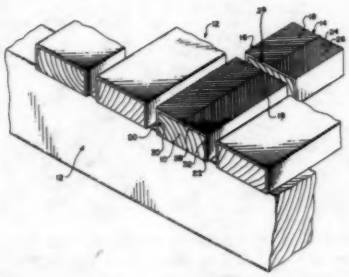
1. A drainage apparatus for hollow core concrete block walls, comprising:
an elongated support frame having upper and lower ends;
said support frame including a pair of spaced-apart, vertically-oriented leg members connected at their upper ends to form an inverted generally U-shaped frame;
fabric attached to said support frame and extending between said upper and lower ends and between said leg members;
said fabric of a type which will absorb water and will permit water to flow therethrough from said upper end to said lower end, to thereby drain water from the core of a concrete block.

4,907,386
SHIELD FOR BUILDING FOUNDATION
Paul Ekroth, 12 Duncannon Ave., Worcester, Mass. 01604
Filed Jul. 8, 1988, Ser. No. 216,669
Int. Cl.[4] E04B 1/92; E02D 19/16
U.S. Cl. 52—169.14 2 Claims



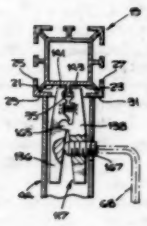
1. Shield for building foundation, comprising:
(a) a concrete slab having upper and lower horizontal surfaces,
(b) a rectangular configuration of concrete walls resting on and extending vertically from the upper surface of the slab, each wall having a substantial horizontal upper surface adopted to receive building sills,
(c) a sheet consisting of a lamination of metal sheet and high strength polymer, the sheet extending over one surface of the slab, extending over one surface of each wall, and extending over the upper end surfaces of each wall to provide a gas-proof enclosure around the foundation, which enclosure is open at the top, wherein the sheet lies over the lower surface of the slab, over the outer vertical surface of the walls, and extends inwardly over the upper end surfaces of the walls.

4,907,387
PATIO DECK SHEATH
James Turnbull, 761-11th Avenue, Fernie, British Columbia, Canada V0B 1M0
Filed Jun. 22, 1988, Ser. No. 210,038
Int. Cl.[4] F16S 3/02
U.S. Cl. 52—177 5 Claims



1. In combination:
a deck having a plurality of spaced apart wooden deck members forming the surface of said deck, each said deck member having a top, sides and a bottom; and
an apparatus for covering said deck members, the apparatus comprising a plurality of channel shaped members, each said channel-shaped member having a flat top portion covering the entire top of one said deck member, the top portion having a rough top surface, said each channel-shaped member having first and second side portions extending generally perpendicular to said top portion, the first and second side portions being generally parallel to each other and being spaced apart and receiving said one deck member therebetween, said side portions extending over the sides of said one deck member from the top to the bottom thereof.

4,907,388
MODULAR PANEL FRAME ASSEMBLY SYSTEM
Mohammed T. Siahatgar, P.O. Box 3904, Laguna Hills, Calif. 92653-3904
Filed Aug. 11, 1988, Ser. No. 231,218
Int. Cl.[4] F16B 7/04
U.S. Cl. 52—584 12 Claims



1. A panel frame assembly system of frame members and member connecting expandable clamps comprising:
a first at least partially hollow frame member having an open end with opposing planar interior surfaces;
a second frame member having a pair of adjacent channels having openings extending along at least one side thereof, said second member having a pair of spaced side rails, each having an in turned end flange extending laterally toward the other to define outer edges of the openings of

the adjacent channels and a center rail of generally T-shaped configuration to provide a center rail end flange with two free edges defining inner edges of the openings of the adjacent channels, said in turned end flange of each of said side rails and said center rail end flange lying in substantially the same plane; and,

an expandable clamp sized to fit within said first frame member via said open end between said planar interior surfaces and having means for expanding at least portions of said clamp to engage said first frame member so as to prevent removal of the clamp therefrom, said expandable clamp comprising a pair of jaws in relatively moveable relation, each comprising a jaw body having a jaw heat mounted in vertically spaced relation to a jaw neck, said jaw heads being spaced apart from each other a distance greater than the width of said center rail end flange and less than the spacing between said side rail end flanges so as to fit into said channels and said means for expanding being provided as to wedge said jaw heads against said second frame member in said channels inwardly thereof relative said plane.

4,907,389

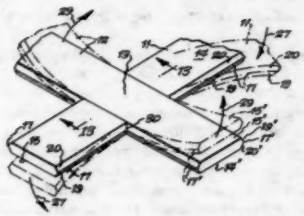
LATTICE WITH INTERLOCKING DOVETAILS

Frederick M. Pettit, 1411 Point Abino Rd. S., Ridgeway, Ontario LOS 1N0, Canada

Continuation-in-part of Ser. No. 104,244, Oct. 5, 1987, abandoned. This application Jan. 22, 1988, Ser. No. 146,380

Int. Cl.[4] E04C *2/42*

U.S. Cl. 52—668 **21 Claims**



1. A self-retaining interlocked lattice comprising a plurality of first strips each having a first longitudinal axis and a first front surface and a first rear surface and first opposite edges, said first opposite edges of each of said first strips including first edge portions which diverge away from each other as they extend from said first rear surface toward said first front surface, a plurality of spaced first dovetail cutouts extending inwardly into each first strip from said first front surface and extending across said first opposite edges, each of said first dovetail cutouts having first opposite dovetail sides which diverge from each other as they extend from said first front surface toward said first rear surface and which effectively terminate at a first inner surface on said first strips, a plurality of second strips each having a second longitudinal axis and a second front surface and a second rear surface and second opposite edges, said second opposite edges of each of said second strips including second edge portions which diverge away from each other as they extend from said second rear surface toward said second front surface, a plurality of second dovetail cutouts extending inwardly into each second strip from said second front surface and extending across said second opposite edges, each of said second dovetail cutouts having second opposite dovetail sides which diverge from each other as they extend from said second front surface toward said second rear surface and which effectively terminate at a second inner surface on said second strips, said first and second strips being oriented with said first and second longitudinal axes transverse to each other and with said first and second dovetail cutouts oriented with said first and second inner surfaces in facing relationship to each other and with said first opposite dovetail sides in locking engagement with said second edge portions and with said second opposite dovetail sides in locking engagement with said first edge portions.

4,907,390

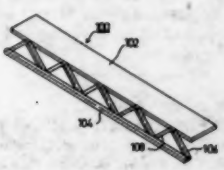
TRUSS MODULE FOR LOAD-BEARING STRUCTURES

Yair Tene, 4 Mapu Blvd., Haifa 34361, Israel

Continuation-in-part of Ser. No. 145,159, Jan. 19, 1988, Pat. No. 4,827,688. This application Apr. 3, 1989, Ser. No. 332,144

Int. Cl.[4] E04C *3/30*

U.S. Cl. 52—694 **12 Claims**



1. A modular constructional element, comprising a truss including a first longitudinally-extending bar extending along one side of the truss, a second longitudinally-extending bar extending along the opposite side of the truss, and a plurality of transversely-extending bars joined at longitudinally spaced points to said first and second longitudinally-extending bars; said transversely-extending bars being joined to said first and second longitudinally-extending bars to occupy a first plane, said first longitudinally-extending bar being disposed in a second plane laterally of said first plane on one side of the transversely-extending bars, and said second longitudinally-extending bar being disposed in a third plane laterally of said first plane on the other side of the transversely-extending bars; said transversely-extending bars being disposed in a repeating pattern with tapered spaces in between, such as to permit a plurality of such trusses to be nested together; said first longitudinally-extending bar having a substantial width in the plane of the respective bar to serve as a deck member in a construction utilizing a plurality of such modular elements.

4,907,391

STRUCTURAL SUPPORT MEMBER FOR WINDOW FRAMES OR THE LIKE

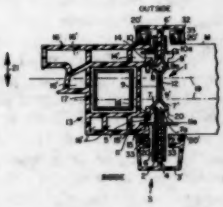
Helmut Over, c/o Christa Maria u. Helmut Over, Hallstattweg 4, 5352 Zuelpich, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,346

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1987, 8708611[U]

Int. Cl.[4] E04C *3/30*

U.S. Cl. 52—731 **10 Claims**



1. A support member for connection to a structural frame component, such as window frame components having at least one lengthwise slot (14, 15) facing said support member (1),

comprising two sectional elements (9, 9') each having two pleated sections (7, 8; 7', 8'), a flat intermediate section (12) between said pleated sections, and an end section (30, 31) away from each pleated section and outside each pleated section, means (12') interconnecting said two sectional elements along said flat intermediate section (12) lengthwise in a mirror image arrangement, said pleated sections forming two lengthwise extending hollow chambers (7a, 8a), each hollow chamber having an open lengthwise gap between its pleated sections, said end sections (30, 31) extending in parallel to each other in pairs to form two lengthwise extending channels (6, 6'), each channel opening laterally from the outside into a respective hollow chamber (7a, 8a) through said lengthwise gap, said sectional elements (9, 9') further comprising at least one engaging flange (10, 11) insertable into said lengthwise slot (14, 15) of said frame component (13) for engaging said slot (14, 15) in a force transmitting manner.

4,907,392

MACHINE FOR APPLYING TWIST-TYPE TIES

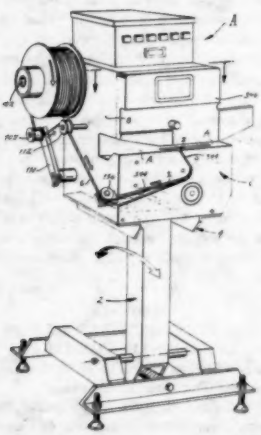
David S. Knudsen, St. Louis, Mo., assignor to Peter S. Miravalle, St. Louis, Mo. and A. D. Lummus, Plano, Tex., a part interest

Continuation of Ser. No. 881,730, Jul. 3, 1986, Pat. No. 4,730,434. This application Feb. 26, 1988, Ser. No. 161,119

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] B65B *51/08*

U.S. Cl. 53—138 A **22 Claims**



1. In a machine for applying a twist-type tie to a bag neck and including ribbon placement means for looping a twist-type ribbon around a gathered bag neck so that the ribbon has two segments which project away from the neck, and twister means for twisting the two segments together, an improved device for holding one segment of the ribbon as the ribbon placement means loops the ribbon around the neck and for severing the other segment as the tie is completed, said device comprising: spaced apart jaws; a clamping element movable generally between the jaws to clamp the ribbon alternately between one side of the element and one jaw and the other side of the element and the other jaw; drive means for moving the clamping element between the jaws; and a shear plate located below the jaws and having cutting edges positioned along the jaws such that the clamping element will move the ribbon across a cutting edge as it clamps the ribbon against a jaw so as to sever the ribbon, the shear plate during operation of the clamping element being in a fixed position with respect to the jaws, yet being spaced from the jaws so that a gap exists between the shear plate and the jaws in the region of the cutting edges on the shear plate.

4,907,393

PACKAGING METHOD AND APPARATUS

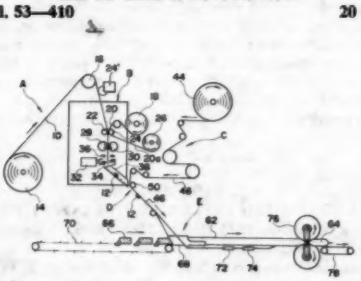
Shozo Omori, Bunkyo, and Takeshi Sekiguchi, Hino, both of Japan, assignors to Omori Machinery Co., Ltd., Saitama and Mitsubishi Gas Chemical Company, Inc., Tokyo, both of, Japan

Filed Oct. 5, 1988, Ser. No. 253,865

Claims priority, application Japan, Oct. 16, 1988, 62-259475

Int. Cl.[4] B65B *1/04, 9/06, 61/20*

U.S. Cl. 53—410 **20 Claims**



1. A packaging method of forming packages, said method comprising the steps of:

supplying auxiliary bags;

adding an adhesive layer to one of the surfaces of each said auxiliary bag;

feeding a continuous sheet-like thermoplastic wrapping material to a forming and filling means;

attaching said auxiliary bags by said adhesive layer to said wrapping material, prior to said wrapping material reaching said forming and filling means, at an interval corresponding to a length of said wrapping material required for forming each package, and each said auxiliary bag being attached to a portion of said wrapping material that becomes the inner surface of the respective package other than sealed portions thereof;

said attaching step being performed by transferring each said auxiliary bag by a chute into a path of said wrapping material with said adhesive layer oriented toward said wrapping material and by attaching said auxiliary bags to said wrapping material by attaching means comprising a guide member for receiving said auxiliary bag from said chute and a support roller facing said guide member, said wrapping material being guided by said support roller to come into press-contact with said auxiliary bag;

forming said wrapping material into a tubular shape with said auxiliary bags inside;

supplying articles into said tubular shaped wrapping material; and

sealing said tubular shaped wrapping material to thereby form the packages.

4,907,394

METHOD FOR PRODUCING A FOIL-CONTAINER, APPARATUS FOR THE IMPLEMENTATION OF THE SAID METHOD, AND A FOIL-CONTAINER PRODUCED ACCORDING TO THE SAID METHOD

Josef Tschepke, Obertshausen; Bernhard Oerther, Maintal, and Eduard Hintermaier, Obertshausen, all of Fed. Rep. of Germany, assignors to Unionpack Industrielle Lohnverpackungs-GmbH & Co., Frankfurt am Main, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,938

Int. Cl.[4] B65B *47/10, 43/10;* **B29C** *51/08, 51/30*

U.S. Cl. 53—412 **19 Claims**

1. A method for producing foil-containers in the form of

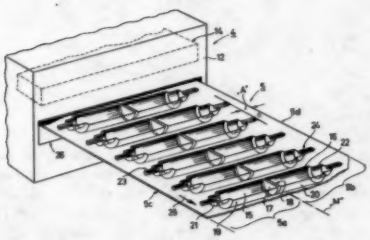
bottles filled with freely flowing substances and having bases upon which they are adapted to stand, comprising:

(a) deep-drawing at least a part of each foil-container, from a piece of flat deformable foil having a plane, having a base-part running substantially at right angles to the plane of the foil, with a neck-section remote from the base-part, and with edge-areas projecting outside the base at the periphery of the container-part;

(b) folding the foil-material about a line located substantially at an edge-like transition between a plurality of base-parts and the plane of the foil;

(c) connecting portions of foil lying on each side of the fold-line and one upon the other in edge-areas after having been folded around, from the base-parts to at least approximately upper ends of half-sections formed thereby, the foregoing steps being a first connecting process;

(d) filling each container through the upper ends of the half-sections;



(e) closing each container;

(f) during the deep-drawing process, forming, on each neck-section, a tubular part directed away from the base-part and which is directed to the nearest foil-edge and has a tubular end at a distance "A" therefrom, and which subsequently ensures a sealed connection between foil-parts lying upon another end of the tubular part and initially not connected;

(g) joining the foil-parts lying one upon the other together in an edge-area, with the exception of a filler opening, at tubular ends;

(h) filling each foil-container through the tubular part;

(i) sealing together the foil-parts lying one upon the other at a tubular end in the vicinity of the filler opening by a second connecting process and, finally,

(j) separating filled and sealed foil-containers individually or into groups.

4,907,395

PACKAGING SYSTEM FOR DISPOSABLE ENDOSCOPE SHEATHS

Eric Opie, Brier; Fred E. Silverstein, Seattle, both of Wash., and Elizabeth J. Terry (executrix of said Eric Opie, deceased), assignors to Opielab, Inc., Seattle, Wash.

Division of Ser. No. 194,034, May 13, 1988. This application Mar. 23, 1989, Ser. No. 328,101

Int. Cl.[4] A61B *1/00;* **B65D** *85/20*

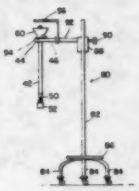
U.S. Cl. 53—434 **7 Claims**

1. A method of packaging and installing a resilient disposable endoscope sheath to prevent said sheath from becoming contaminated, said method comprising:

placing said sheath in a nonresilient, elongated bag having a closed distal end and an open proximal end, said bag having a length that is substantially equal to the length of an endoscope insertion tube on which said sheath is to be installed and a diameter that is larger than the diameter of said insertion tube, said sheath being positioned in said bag with its open end positioned at the proximal end of said bag;

inflating said sheath until it expands to contact the inner wall of said bag so that said bag restricts the expansion of said sheath at a diameter that is substantially equal to the diameter of said bag;

inserting the insertion tube of said endoscope into the open end of said sheath while said sheath is in its expanded condition in said bag;



deflating said sheath to allow said sheath to contract away from the wall of said bag and onto the outer surface of said insertion tube of said endoscope; and

removing said insertion tube and surrounding sheath from said bag so that said endoscope can be used to conduct an endoscopic examination or procedure.

4,907,396

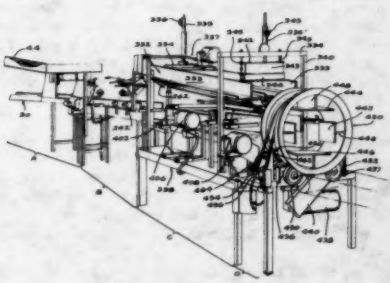
APPARATUS AND METHOD FOR PACKAGING CITRUS FRUIT

Stanley McClusky, and Jerry L. Boyd, both of Bakersfield, Calif., assignors to McClusky Machinery Sales & Service, Inc., Edison, Calif.

Filed Oct. 20, 1988, Ser. No. 260,437

Int. Cl.[4] B65B *5/10, 25/04, 35/52*

U.S. Cl. 53—437 **10 Claims**



1. In a method for packaging citrus fruit in a box having an outer box part and an inner box part having side and end flaps the steps of:

advancing fruit along a selected path;

directing and singularizing the advancing fruit into counting station having a plurality of counting stalls arranged in a transverse row;

advancing inverted boxes with an inner box part having side and end flaps providing an opening to receive fruit discharged from the counting station;

filling each box with a selected number of fruit;

advancing the filled boxes along a selected path;

spreading the side flaps of the inner box part;

grasping said side flaps and lifting the inner box part while holding the outer box part against the lifting movement;

tucking and folding the side and end flaps of the inner box into closed position;

vibrating the closed filled box to settle and uniformly distribute the fruit therein;

pressing the inner box part downwardly during vibration of

the box to bring said inner box part and outer box part into full closed relation; and

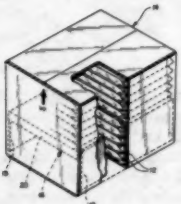
rotating the closed box to an upright position;

4,907,397

SHELF PACKER

James A. Goodman, Glencoe, Ill., assignor to Prototype Equipment Corp., Glencoe, Ill.

Division of Ser. No. 47,817, May 8, 1987, Pat. No. 4,815,251.
This application Oct. 13, 1988, Ser. No. 257,067
Int. Cl.[4] B65B *5/10*
U.S. Cl. 53—443 **26 Claims**



1. A method for packing a box with a plurality of flexible containers and inserting an intermediate self-supporting shelf means in the box to support a portion of the containers in the box, the shelf means including a container-supporting portion, two stiffening legs, and two shelf-supporting legs formed from a shelf blank, by:

orienting the box such that the flexible containers can be inserted into the box;

conveying the pouches by means of a first flexible container conveyor;

gripping and transferring from the first pouch conveyor to the box by means of a first vacuum head mechanism;

gripping a shelf blank by means of a shelf gripped fixed to a free end of a piston rod and pneumatic cylinder arrangement, cooperating with the pneumatic cylinder to move a shelf blank above a box;

gripping a shelf blank by means of a vacuum head;

forming the support legs and guiding the support legs of the shelf means into the box by means of a support leg folder;

inserting the shelf into the box by means of cooperation between the vacuum head, the support leg folder, and a second and a third pneumatic cylinder;

conveying pouches by means of a second pouch conveyor; and

gripping and transferring flexible containers from the second flexible container conveyor to the box by means of a second vacuum head mechanism.

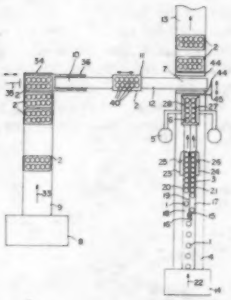
4,907,398

METHOD AND APPARATUS FOR THE AUTOMATIC FILLING OF TRAYS WITH UPRIGHT PRODUCTS

Joachim Holze, Monheim-Baumberg; Michael Kik, Langenfeld; Juergen Leitzen, Wuppertal; Helmut Korn, Dormagen; Hans Plotsch, Duesseldorf, and Leo Meschler, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 240,031
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729324
Int. Cl.[4] B65B *35/36, 35/54*
U.S. Cl. 53—443 **19 Claims**

1. A device for placing at least two rows of articles in a receiving tray having a plurality of recesses therein to support said articles in an upright position; said device comprising a first conveyor belt on which said articles, standing upright, are delivered individually and aligned in parallel rows to a preliminary loading station and thereat said articles are divided into a group having a predetermined number of articles; a tray unstacking means associated with a tray conveyor belt leading to a tray positioning station; said tray positioning station being connected to a tray carriage which is movable over a guide rail to a tray filling station; a handling device for gripping and raising said group having a predetermined number of articles to a loading station and for placing said group of articles into said receiving tray at said tray filling station; said handling



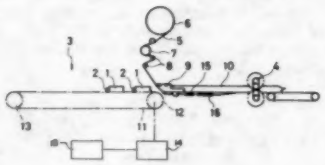
device being adapted to rotate about an axis which is conveyed linearly between two stations and consisting essentially of a gripper head having a centering frame with a rigid core portion conforming to the outer surface contours of said group of articles, and inflatable rubber pads mounted int he lateral boundaries of said gripper head which are connected to compressed air supply lines; and an output conveyor for transporting the receiving tray away from said tray filling station.

4,907,399

AUTOMATIC PACKAGING METHOD

Masaru Yamamoto, Iruma, Japan, assignor to Omori Machinery Co., Ltd., Saitama, Japan

Filed May 11, 1988, Ser. No. 193,274
Claims priority, application Japan, May 13, 1987, 62-114483
Int. Cl.[4] B65B *9/06*
U.S. Cl. 53—450 **3 Claims**



1. An automatic method of packaging articles, said method comprising:

conveying a band-shaped film and forming said band-shaped film into a tubular shape during travel thereof;

conveying articles to be packaged and transferring said articles into said tubular film, said conveying comprising advancing said articles by abutting trailing ends of said articles with flights connected at predetermined equal intervals to a conveying;

sealing said tubular film at a predetermined pitch to thereby form individual bags having therein respective said articles;

said equal intervals between adjacent said flights being different from said predetermined sealing pitch;

maintaining the conveying speed of said film substantially constant; and

controlling the speed of movement of each of said articles to

normally be different than said conveying speed of said film, thereby to compensate for the difference between said flight interval and said sealing pitch, and adjusting said speed of movement of each said article to be equal to said conveying speed of said film during a period of time when said each article is transferred into said tubular film.

4,907,400

AGRICULTURAL MOWER HAVING MEANS FOR RAISING THE REEL TO A CLEARING HEIGHT WHEN THE CUTTER BAR ENGAGES AN OBSTACLE

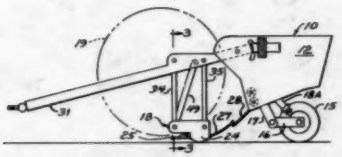
Thomas V. Roden, 3775 Hwy. I, Saukville, Wis. 53080

Filed Sep. 12, 1988, Ser. No. 242,884

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] A01D *75/18, 34/04, 67/00*

U.S. Cl. 56—10.4 **5 Claims**



1. In an agricultural mower having a wheel-supported main frame a cutter mechanism extending across the width of the frame for cutting a swath of crop and having first and second sides; a reel driven in rotary motion about a horizontal axis transverse of the direction of travel of said mower and first and second support arm means for supporting said reel in cantilever in front of said main frame and above said cutter mechanism, the improvement comprising: first and second four-bar suspension linkages for mounting respectively said first and second sides of said cutter mechanism to said main frame for permitting said cutter mechanism to move in pendulum-type motion when striking an obstacle on the ground, said suspension linkages being generally vertical in the normal use position whereby the initial movement of said cutter mechanism is primarily rearward and thence upward when an obstacle is struck; and first and second lift linkage means interconnecting said first and second sides of said cutter mechanism respectively with said first and second reel support arms means, said suspension linkages, lift linkage means and reel support arms means being constructed and arranged to raise said reel when said cutter mechanism engages an obstacle.

4,907,401

DRIVE ASSEMBLY FOR WALKING MOWERS

Shusuke Nemoto, Yao; Norihiro Ishii, and Hiroaki Shimizu, both of Itami, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Jun. 8, 1989, Ser. No. 363,474

Claims priority, application Japan, Jun. 24, 1988, 63-84149[U]

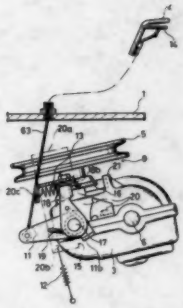
Int. Cl.[4] A01D *69/10*

U.S. Cl. 56—11.3 **4 Claims**

1. A drive assembly for self-propelled walking mowers which comprises: a transmission casing (3) supported by a machine frame (1) which has a steering handle (2); an input shaft (4) extending outwardly from said transmission casing and having thereon an input pulley (5) at an outside of said transmission casing; a wheel axle (6) extending leftwards and rightwards from an inside of said transmission casing; and a speed-change mechanism (7) disposed within said transmission casing and operable to transmit a rotation of said input shaft to said wheel axle with stepwisely changeable speeds of rotation, characterized in:

that said transmission casing (3) is supported by said machine frame (1) through said wheel axle (6) rotatably about said wheel axle so as to provide a main clutch (9) which is operable to continue and discontinue input of power into said transmission casing by a selective tightening and loosening of a belt (8), entrained over said input pulley (5), as a result of a selective rotational displacement of said transmission casing, said transmission casing being biased by a first spring means (12) to rotate towards a direction of disengaging said main clutch;

that an auxiliary clutch (10) operable to connect and disconnect between said speed-change mechanism (7) and said wheel axle (6) is disposed within said transmission casing (3), said auxiliary clutch being kept in its disengaged condition by a second spring means (13) and adapted to be



engaged by a clutch lever (14), provided to said steering handle (2), through a rotatable clutch control arm (11; 116) which is disposed outside said transmission casing and is supported by the said casing; and

that said transmission casing (3) carries at an outer surface thereof a stop means (15) which is operable, when said clutch lever (14) is operated so as to engage said auxiliary clutch (10) and after the said clutch has been engaged, to limit a rotational displacement of said control arm (11; 116) relative to said transmission casing so that the said casing is rotated in unison with said control arm towards a direction of engaging said main clutch (9).

4,907,402

UNLOADING SYSTEM

Daniel Pakosh, Winnipeg, Canada, assignor to Ford New Holland, Inc., New Holland, Pa.

Continuation of Ser. No. 51,234, May 14, 1987, abandoned, which is a continuation of Ser. No. 664,069, Oct. 23, 1984, abandoned, which is a division of Ser. No. 178,014, Aug. 13, 1980, Pat. No. 4,492,237. This application Oct. 27, 1988, Ser. No. 263,983

Claims priority, application Canada, Aug. 13, 1979, 333765

Int. Cl.[4] A01D *41/00*; **B60P** *1/42*

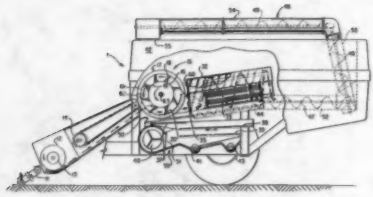
U.S. Cl. 56—14.6 **4 Claims**

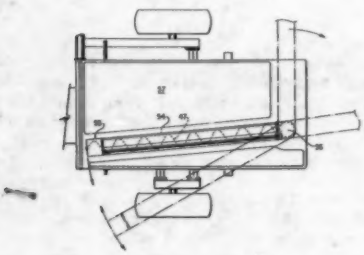
1. In a combine harvester having a mobile frame adapted for movement over a field; a crop threshing and separating means mounted on said frame to thresh and separate grain from crop material; a crop gathering means forwardly supported from said frame for collecting crop material from the field and conveying said crop material to said threshing and separating means; a cleaning mechanism supported on said frame below said threshing and separating means to receive grain therefrom and to clean unwanted debris from said grain; a clean grain tank supported by said frame above said cleaning mechanism and including collecting means to collect said cleaned grain for elevation into said clean grain tank; and an unloading mechanism operatively associated with said clean grain tank for selectively discharging clean grain therefrom externally of said combine harvester, an improved unloading mechanism comprising:

a generally upright auger section positioned proximate to a

longitudinally extending centerline of said combine harvester and adjacent to rearwardmost portion of said combine harvester, said upright auger section extending from adjacent a lowermost portion of said grain tank to a position elevated above said grain tank; and

a generally horizontal auger section operatively connected to said upright auger section in flow communication therewith and having a remote discharge opening, said horizontal auger section having a transport position wherein said horizontal auger section extends generally forwardly from said upright auger section to position said





discharge opening over said clean grain tank, said horizontal auger section being rotatable about an axis corresponding to said generally upright auger section through an arc of rotation having an angular displacement of approximately 270 degrees from said transport position, extending along one side of said combine harvester and rearwardly thereof to the opposing side of said combine harvester to permit the discharge of grain from said clean grain tank through said discharge opening along said arc of rotation substantially equidistantly on either side of said combine harvester.

4,907,403

GRASS MOWER IMPROVEMENT

Otis Jones, 1577 Waite St., Gary, Ind. 46404

Filed Feb. 6, 1989, Ser. No. 306,996

Int. Cl.[4] A01D *34/12, 34/48, 34/70, 35/035*

U.S. Cl. 56—202 **11 Claims**

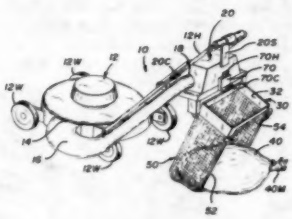
1. In combination with a lawn mower of the type which is designed to be moved over the ground and wherein clippings are propelled through an exit port, a disposable bag mounting apparatus coupled to receive the clippings propelled from the exit port and hold a disposable bag, comprising:

means coupled to the exit port for guiding the clippings to an elevated position on the mower;

a sling sized and shaped for receiving the disposable bag, said sling having an upper area defining an upward facing opening and a bottom portion and said sling being substantially open to one horizontal direction when in its operational position and in its unloading position so that a filled disposable bag may be moved out of said sling in that direction and through said open side;

means for releasably securing the disposable bag with its open end positioned in an upwardly opening configuration at said upward facing opening of the upper area of said sling with the disposable bag's main closed body depending downward in said sling;

means for mounting said sling and the disposable bag therein in an operational position to said mower wherein the open end of the bag is under said elevated position so as to receive clippings propelled by the mower during opera-



tion through the exit port to said elevated position into said disposable bag in said sling, wherein the clippings are collected and held, said means for mounting said sling also supporting said sling when in this operational position such that the bottom of said sling clears the ground in normal use, said mounting means further allowing the bottom of said sling to be selectively lowered to the ground to assume an unloading position such that the disposable bag may be unloaded therefrom by rolling it out of the substantially open horizontal direction of said sling, and wherein thereafter said sling may be returned to its operational position.

4,907,404

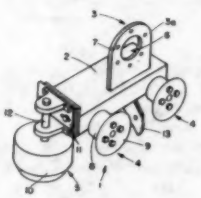
CUTTING ARRANGEMENT

George R. Oliver, and Stephen G. Oliver, both of 14 Caxton Place, Te Awamutu, New Zealand

Filed Aug. 25, 1988, Ser. No. 236,560

Int. Cl.[4] A01D *34/84*

U.S. Cl. 56—256 **8 Claims**



1. A cutting assembly for cutting vegetation along a curb, releasably attachable to propulsion means, said cutting assembly comprising a housing, said housing having a top surface, a front surface and side surfaces, attaching means for said cutting assembly on the top surface of said housing and extending outwardly therefrom, at least one cutting means attached to one side of the housing, said cutting means comprising a generally vertical rotatable cutting blade spaced from the side of the housing, guide means adjustably locatable in relation to the housing and horizontally rotatable, whereby when said cutting assembly is attached to said propulsion means, the guide means extends to contact one side of a curb to position the vertical

cutting blade on the other side of said curb to trim vegetation alongside on said other side of said curb.

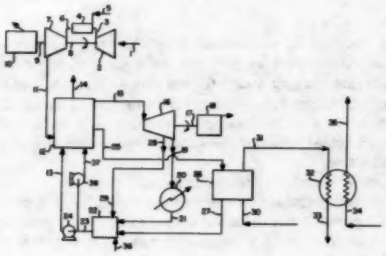
6. A method of cutting vegetation about or adjacent a curb, which comprises the steps of attaching to an anxle of a vehicle a cutting assembly, said cutting assembly comprising a housing, said housing having a top surface, a front surface and side surfaces, attaching means for said assembly located on the top surface of said housing and extending outwardly therefrom, cutting means attached to a side of said housing and comprising a rotatable generally vertical cutting blade spaced from the side of the housing, said guide means being horizontally rotatable and adjustably locatable in relation to the housing whereby when the cutting assembly is attached to the vehicle, the guide means extends to contact one side of a curb to position the vertical cutting blade on the other side of the curb to trim any vegetation alongside the other side of the curb.

4,907,405

PROCESS TO COOL GAS

Robert J. Polizzotto, East Amherst, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 24, 1989, Ser. No. 300,914
Int. Cl.[4] F02C *6/18*
U.S. Cl. 60—39.02 **18 Claims**



1. Process to cool gas comprising:
(A) combusting fuel and oxidant to produce elevated pressure hot gas;
(B) expanding elevated pressure hot gas through a gas turbine for the production of external work;
(C) passing expanded hot gas in heat exchange relation with elevated pressure water to produce high pressure steam and low pressure steam;
(D) passing low pressure steam through an absorption chiller to cool liquid; and
(E) passing cooled liquid in indirect heat exchange relation with gas to cool the gas.

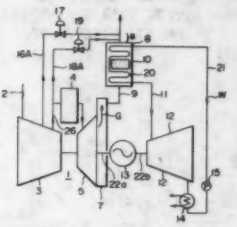
4,907,406

COMBINED GAS TURBINE PLANT

Seiichi Kirikami; Isao Sato; Fumiyuki Hirose; Osamu Arai, and Nobuyuki Iizuka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,939
Claims priority, application Japan, Jun. 23, 1987, 62-154487
Int. Cl.[4] F02C *6/18, 9/18*
U.S. Cl. 60—39.182 **9 Claims**

7. A combined gas turbine plant comprising:
an air compressor means;
a combustor means for generating a gas of a high temperature and a high pressure;
a gas turbine means operable by said combustor means;
exhaust heat recovery means including denitration means disposed in an exhaust gas passage means of said gas turbine means; and
means for extracting air from said compressor means and for bypassing said denitration means by leading the extracted air to a portion of the exhaust gas passage means down-



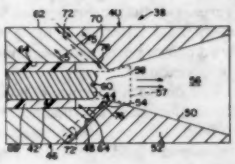
stream of the denitration means thereby preventing a cooling of exhaust gases supplied to the denitration means.

4,907,407

LIFETIME ARCJET THRUSTER

Mark A. Simon, Redmond; Steve Knowles, and William Smith, both of Seattle, all of Wash., assignors to Olin Corporation, Stamford, Conn.

Filed Feb. 10, 1988, Ser. No. 154,405
Int. Cl.[4] F03H *1/00*
U.S. Cl. 60—203.1 **27 Claims**



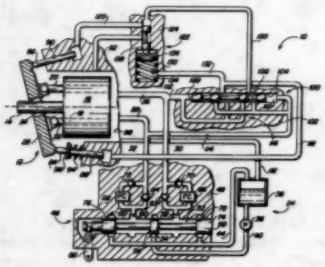
1. In an arcjet thruster, the combination comprising:
(a) an electrically-conductive anode body having oppositely-tapered upstream and downstream interior conical surfaces about a common axis, said downstream interior conical surface defining a nozzle having tandemly-arranged upstream throat and downstream expansion regions which together define an arc chamber of generally nonparallel supersonic configuration, said upstream and downstream interior conical surfaces merging at a location of minimum diameter which defines said upstream throat of said nozzle;
(b) an elongated electrically-conductive cathode member having a tip disposed adjacent to said upstream interior conical surface of said anode body and spaced upstream from said nozzle throat region by a gap;
(c) means for applying an electrical potential to said anode body and cathode member so as to generate an electrical arc in said arc chamber extending from said cathode member tip to said anode body which due to location of said nozzle throat region and supersonic configuration of said nozzle attaches to said anode body at a location downstream of said nozzle throat region; and
(d) means for supplying a flowing propellant gas radially and tangentially into said arc chamber through said nozzle throat region at about sonic velocity concurrently with the generation of said arc so as to cause said arc to attach to said anode at a location downstream of said nozzle throat region and produce thermal heating of said flowing gas in said chamber and expansion thereof through said nozzle expansion region.

4,907,408

VARIABLE DISPLACEMENT HYDRAULIC SERVOMOTOR SYSTEM

Brian P. Barker, Chandler, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 22, 1988, Ser. No. 185,002
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—451 20 Claims



1. Hydraulic servo apparatus comprising:

pressure fluid source means for supplying a flow of pressurized fluid and for receiving returned fluid;

bidirectional variable-displacement hydraulic motor means having a pair of fluid inlet/return ports, the function of each one of said pair of ports being dependent upon direction of motor operation;

double acting fluid pressure responsive actuator means for changing the displacement of said motor means and in response to a fluid pressure differential applied to a pair of oppositely disposed fluid pressure responsive faces thereof;

directional control means for alternatively communicating said flow of pressurized fluid to either of said pair of motor ports and for directing returned fluid from the other of said pair of ports to said fluid source means;

flow control means interposing between the other of said pair of ports and said source means for throttling said returned fluid only at and above a determined flow rate thereof, said throttling of said returned fluid increasing with fluid flow rate above said determined flow rate;

pressure responsive bistable valve means communicating with said pair of motor ports for shifting between two alternative positions to communicate the one of said motor ports having the lower fluid pressure to the one of said pair of oppositely disposed faces of said actuator means effecting a decrease of motor displacement, and communicating the one of said pair of motor ports having the higher fluid pressure to the other of said pair of oppositely disposed faces of said actuator means effecting an increase of motor displacement, and

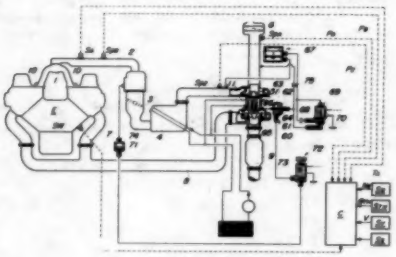
pressure differential responsive metering valve means closing said communication between said bistable valve means and said double-acting actuator means, said metering valve means being responsive to a selected pressure differential between said pair of motor ports to open said communication of said higher fluid pressure to said other pressure responsive face of said actuator means to effect a fluid pressure differential there at, and said metering valve proportionately metering said higher fluid pressure to said actuator means proportionately at pressure differentials above said selected level to increase displacement of said motor means.

4,907,409

SUPERCHARGING PRESSURE CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Kazuo Inoue; Noriyuki Kishi; Masao Kubodera, and Eitetsu Akiyama, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,432
Claims priority, application Japan, Dec. 29, 1987, 62-334196; Apr. 19, 1988, 63-97600
Int. Cl.[4] F02B 37/12
U.S. Cl. 60—602 5 Claims



1. A method of controlling supercharging pressure in an internal combustion engine having a supercharger having increase rate-varying means for varying an increase rate of the supercharging pressure, wherein the supercharging pressure is controlled to a desired value in response to a difference between an actual value of the supercharging pressure and said desired value,

the method comprising the steps of:

(1) detecting the actual value of the supercharging pressure;

(2) Comparing the detected actual value of the supercharging pressure with a predetermined value which is lower than said desired value; and

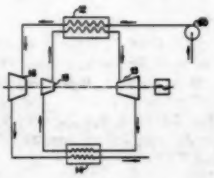
(3) holding said increase rate-varying means in a position for obtaining the maximum increase rate of the supercharging pressure while the detected actual value of the supercharging pressure is lower than said predetermined value.

4,907,410

THERMAL ENERGY FROM ENVIRONMENTAL FLUIDS

Yan P. Chang, 181 Sherbrooke Ave., Williamsville, N.Y. 14221

Continuation of Ser. No. 133,146, Dec. 14, 1987, abandoned.
This application Oct. 28, 1988, Ser. No. 266,213
Int. Cl.[4] F01K 23/04
U.S. Cl. 60—641.6 13 Claims



1. A method of utilizing environmental fluids as heat sources for energy conversion systems, each including: a first heat exchange means operatively associated with a heat source; a prime mover operating on a closed cycle and operatively associated with the first heat exchange means; a further cooling system operatively associated also with the first heat exchange means; a second heat exchange means operatively associated with the prime mover and the further cooling system; and an

auxiliary system for starting the operation of the energy conversion system; said method comprising steps of:

(a) utilizing the aforesaid heat sources as open reservoirs;

(b) admitting a source fluid to the first heat exchange means;

(c) applying a coolant provided by the auxiliary starting system to the second heat exchange means for initiating the release of thermal energy from the source fluid and for starting the operation of the energy conversion system;

(d) disconnecting the auxiliary starting system for the steady state operation;

(e) continuing to pass the source fluid through the first heat exchange means wherein the working fluid of the prime mover is heated and the source fluid is cooled thereby;

(f) allowing the heated working fluid to expand in the prime mover to do work;

(g) conducting a cooled source fluid effluent from the first heat exchange means into a further cooling system to become further cooled;

(h) utilizing the further cooled source fluid to cool the expanded working fluid of the prime mover through the second heat exchange means;

(i) utilizing the source fluid effluent from the energy conversion system for other cooling and refrigeration processes, and

(j) integrating more than one of such energy conversion systems into one unit to increase the output and to reduce the capitol investment.

4,907,411

INTERNAL COMBUSTION CHAMBER ARRANGEMENT

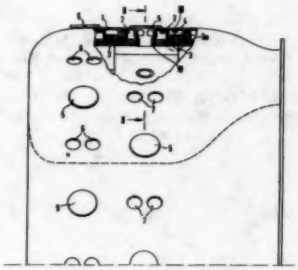
Wolfgang Krüeger, Reichertshausen, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 870,371, Jun. 4, 1986, abandoned. This application May 26, 1988, Ser. No. 201,367

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519938

Int. Cl.[4] F23R *3/06, 3/60*

U.S. Cl. 60—753 **13 Claims**



1. A combustion chamber, comprising a flame tube means of high heat-resistant ceramic material, a casing-like metallic ring-shaped wall means surrounding the flame tube means which forms a liner, while leaving an intermediate space, air feed openings in the flame tube means so that air flows radially into the flame tube means through a large number of short pipe sections, said pipe sections passing through openings in the flame tube means and aperture means in the metallic wall means, a mounting means for the ring segments of the ceramic flame tube means which is assembled of sheet metal members in the casing-like wall means for the ring segments in such a manner that neither the sheet metal mounting means nor short pipe sections for the air supply have heat contact with respect to the flame tube means and that the cooling air is so conducted that it enters into the casing-like means at first into an intermediate space with respect to the sheet metal members, sweeps peripherally along the same before it flows by way of the short pipe sections through openings in the flame tube means into the combustion chamber and thereby partial flows enter into a second intermediate space between the sheet metal members and the flame tube means, directly adjacent the flame tube means and cooling the sheet metal members and flame tube means.

4,907,412

REFRIGERATOR

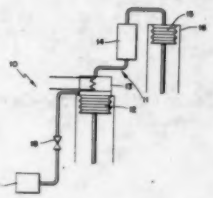
Kiyoshi Ishibashi, Toyota, and Hideo Mita, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 12, 1987, Ser. No. 25,076

Claims priority, application Japan, Mar. 13, 1986, 055727

Int. Cl.[4] F02G *1/06*

U.S. Cl. 62—6 **9 Claims**



1. A refrigerator comprising:

an expansion chamber;

a compression chamber operatively connected to said expansion chamber to form a working space;

a vessel connected to said working space and having a variable volume for storming therein a working medium under a pressure balanced to the average cycle pressure in said working space; and

capillary means for providing a flow restriction between said working space and said vessel

wherein said vessel comprises a bellows arrangement defining a closed space.

4,907,413

REGENERABLE CRYOSORPTION PUMP WITH MOVABLE PHYSICAL BARRIER AND PHYSICAL BARRIER THEREOF

Ian Clarkson, Huntington; Bruce Abel, Sayville, and Douglas W. Sedgley, Bethpage, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 2, 1988, Ser. No. 201,765

Int. Cl.[4] B01D *8/00*

U.S. Cl. 62—55.5 **19 Claims**

1. A regenerable cryopump for use in a fusion reactor system for separating helium from a tritium stream being processed, said pump provided with a housing and mounted to said reactor system, comprising:

a sorbent surface for sorbing helium molecules;

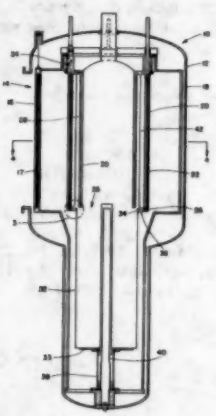
a deuterium-tritium (DT) pumping surface for pumping hydrogen isotopes;

a pumping chambewr comprising a chevron separating array integrally connected with heat shielding means; and

a movable cylindrical barrier;

whereby said barrier is movable from a first position when said cryopump is in an operating mode to a second posi-

tion isolating said sorbent surface from said DT pumping surface when said cryopump is in a regenerable mode to



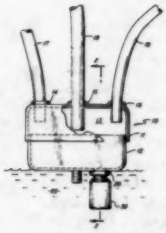
isolate said helium molecules from said hydrogen isotopes during regeneration.

4,907,414

REFRIGERANT INJECTION INTO OIL FOR SOUND REDUCTION

Howard H. Fraser, Jr., Lafayette, and Jacob A. Bayyouk, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,853
Int. Cl.[4] F25D *19/00*
U.S. Cl. 62—56 **3 Claims**



1. A method for reducing radiated sound levels in low side hermetic compressors comprising the steps of:

supplying pressurized refrigerant to a muffler which is in fluid communication with a discharge line;

diverting a small portion of the pressurized refrigerant supplied to the muffler; and

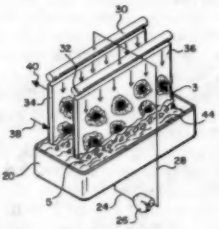
injecting the diverted pressurized refrigerant into an oil sump at a point beneath the surface of the oil whereby a supersaturated solution of refrigerant in oil is created in the upper level of the oil in the sump which drives the refrigerant out of the oil in the upper level to create a froth without disturbing the lower level of the oil in the sump.

4,907,415

SLUSH ICE MAKING SYSTEM AND METHODS

William E. Stewart, Jr., Olathe, Kans.; Michael E. Greer, Gladstone, Mo., and Carol L. G. Dona, Overland Park, Kans., assignors to The Curator of the University of Missouri, Columbia, Mo.

Filed Nov. 23, 1988, Ser. No. 276,137
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—66 **10 Claims**



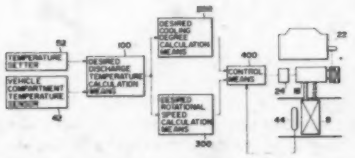
1. Apparatus operable to produce "slush", said apparatus including at least one heat exchanger having at least one downwardly extending surface selectively cooled by a refrigerant selectively flowing through said heat exchanger and selected liquid means directed along a downward path and in heat exchange relationship with said downwardly extending surface to selectively cool said selected liquid means, said selected liquid being such that when slush consisting of a mixture of said selected liquid means and solids forms and selectively accumulates on said downwardly extending surface, forces resulting from gravity and the interactions with said selected liquid means are sufficient to overcome the adhesion forces between at least a portion of said slush and said downward extending surface causing at least a portion of said slush to separate from said downward extending surface.

4,907,416

AIR-CONDITIONER FOR AUTOMOBILES

Kazuo Fujii, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,613
Claims priority, application Japan, Jun. 21, 1988, 63-153323
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—180 **3 Claims**



1. An air-conditioner for an automobile, comprising:

(a) a refrigeration cycle including an evaporator through which intake air is forced to pass, and a compressor adapted to be driven by an engine of the automobile;

(b) an intake air temperature sensor for detecting the temperature of intake air before being passed through said evaporator;

(c) displacement adjustment means for regulating the displacement of said compressor;

(d) desired discharge temperature calculation means for calculating a desired temperature of air discharged into a vehicle compartment of the automobile based on the outputs from at least a temperature setter and a vehicle compartment temperature sensor:

(e) desired cooling degree calculation means for calculating a desired degree of cooling of said evaporator based on the result of calculation by said desired discharge temperature calculation means;

(f) desired rotational speed calculation means for calculating a desired rotational speed of a blower based on the result of calculation by said desired discharge temperature calculation means; and

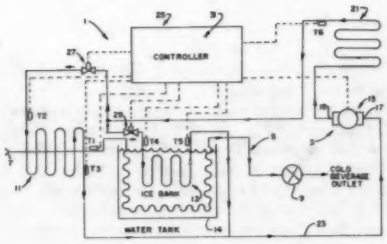
(g) control means for calculating an amount of adjustment of said displacement adjustment means based on the output from said intake air temperature sensor, the result of calculation by said desired cooling degree calculation means and the result of calculation by said desired rotational speed calculation means.

4,907,417

REFRIGERATION CONTROL SYSTEM FOR COLD DRINK DISPENSER

David P. Forsythe, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 21, 1988, Ser. No. 171,455
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—199 **19 Claims**



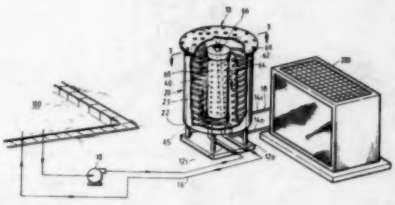
1. In a cold drink dispenser having a beverage inlet, a beverage outlet, a beverage flow path between said inlet and said outlet, and a refrigeration system for chilling said beverage to a predetermined temperature as the beverage flows through said flow path, said refrigeration system comprising a compressor, a condenser for receiving high pressure refrigerant from said compressor, a first coil supplied with high pressure refrigerant from said condenser, a second coil supplied with high pressure refrigerant from said condenser, and a suction line for returning refrigerant from each of said coils to said compressor, an ice bath having a liquid therein, said second coil being at least in part in heat transfer relation with said liquid for forming an ice bank, said flow path being in heat transfer relation first with said first coil and then with said liquid, wherein the improvement comprises: a first modulatable expansion valve between said condenser and said first coil for effecting expansion of said refrigerant as it flows through said first expansion valve, a second modulation expansion valve between said condenser and said second coil for effecting expansion of said refrigerant as it flows through said second expansion valve, control means associated with each of said valves for generating a modulated control signal for each of said valves for effecting modulated control of said valves thereby to regulate the flow of refrigerant through said valves, means for generating a signal responsive to tee temperature of said beverage in said flow path upstream from said second coil with this last said temperature constituting a first coil beverage outlet temperature, means responsive to said first coil beverage outlet temperature for operating said first valve so as to block the flow of refrigerant therethrough when said first coil beverage outlet temperature is below a firs predetermined first coil beverage outlet temperature and for modulating said first valve when said first coil beverage outlet temperature is above said first predetermined first coil beverage outlet temperature, and means responsive to the size of said ice bank for blocking operation of said second valve upon said ice bank attaining a desired maximum size and for permitting operation of said second valve upon said ice bank decreasing below said maximum size.

4,907,418

LIQUID HEATING SYSTEM PARTICULARLY FOR USE WITH SWIMMING POOLS OR THE LIKE

Louis C. DeFazio, 16603 Creeksouth, Houston, Tex. 77068

Filed Nov. 14, 1988, Ser. No. 270,836
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—238.6 **16 Claims**



1. A system for heating liquid which uses the waste heat from the refrigerant in an air conditioning or refrigeration system, said system comprising in operative combination:

a sealed tank having water inlet and outlet connections and refrigerant inlet and outlet connections;

a refrigerant cooling system contained within said sealed tank and connected to said refrigerant inlet and outlet connections;

a substantially cylindrical water flow manifold contained within said refrigerant cooling coil system and connected to said water inlet and outlet connections, said eater flow manifold having a plurality of substantially tangentially formed holes positioned and arranged to impart a substantially cylindrical flow of liquid within said sealed tank and over said refrigerant cooling coil system;

whereby waste heat from the refrigerant in the air conditioning or refrigeration system is transferred to the liquid to be heated through said refrigerant cooling coil system.

4,907,419

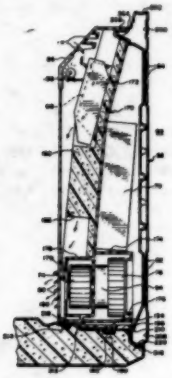
MODULAR MECHANICAL REFRIGERATION UNIT

Richard W. Kruck, Sodus Township, Berrien County; Omer N. Cur; Douglas D. Leclear, both of St. Joseph Township, Berrien County; Steven J. Kuehl, Royalton Township, Berrien County, all of Mich., and Ralph R. Burin, Milton Township, DuPage County, Ill., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 12, 1988, Ser. No. 218,233
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 **13 Claims**

1. A mechanical refrigeration unit adapted to form a relatively thin wall portion of a refrigeration apparatus, comprising a main divider wall spaced from an inner wall of said unit and having a first layer of insulating material on the side thereof facing said inner wall, an evaporator mounted on said divider wall and positioned between said first layer and said inner wall, fan means mounted on said divider wall below said evaporator for moving air over said evaporator and having an inlet facing said inner wall, and a second layer of insulating material positioned between said evaporator and said fan

means, said second layer being shaped to form an air duct between said evaporator and said inlet of said fan means,



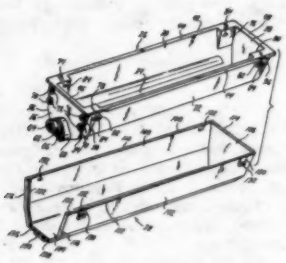
thereby to facilitate the drawing of air downwardly over said evaporator.

4,907,420

DUAL WALL EVAPORATOR PAN

Herbert S. Mahanay, Waterloo, and Russell W. Hoeffken, Belleville, both of Ill., assignors to Snyder General Corporation, Red Bud, Ill.

Filed Jun. 13, 1988, Ser. No. 205,733
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—291 13 Claims



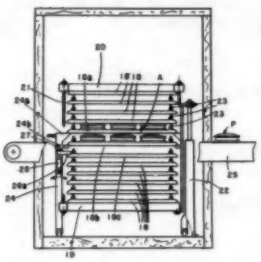
1. An evaporator pan assembly comprising an inner pan having walls defining a pan capable of containing water and having an open side, an outer pan having walls surrounding at least most of the walls of the inner pan and spaced therefrom, the space between the inner and outer pan walls defining an air wall, means for rendering the air space fluid tight, and means defining a channel in a lower portion of the inner pan for concentrating the collection of liquid, and a drain opening through a wall of the inner pan communicating with the channel.

4,907,421

AUTOMATIC PLATEFREEZER, WITH HORIZONTAL FREEZING PLATES, SUITABLE TO APPLY PRESSURE ON THE PRODUCT DURING NORMAL FREEZING OPERATIONS

Guido Battistella, Milan, Italy, assignor to Stal Samifi S.p.A., Italy

Filed Jul. 25, 1988, Ser. No. 223,555
Claims priority, application Italy, Jul. 31, 1987, 21546 A/87
Int. Cl.[4] F25C *5/14*
U.S. Cl. 62—341 7 Claims



6. Automatic plate freezer with substantially horizontal freezing plates, comprising

means for applying pressure during loading of each plate, on all plates previously loaded, said means comprising

at least one catch arm provided with double supports positioned to ensure an opening between plates for loading upon a plate being loaded while also maintaining the plate being loaded at a substantially constant level,

wherein said means additionally comprise an upper frame and a lower frame interconnected by at least one rod and with the plates disposed therebetween,

means for lifting and lowering said plates, and

wherein said pressure applying means additionally comprise a piston and rod arrangement hinged to said at least one arm, and

a bracket mounted upon said piston rod.

4,907,422

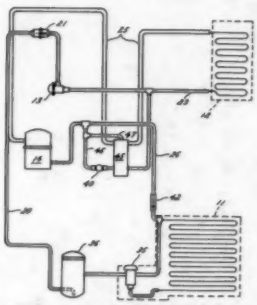
HARVEST CYCLE REFRIGERANT CONTROL SYSTEM

Vance L. Kohl, and Charles E. Schlosser, both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation of Ser. No. 251,803, Sep. 30, 1988, Pat. No. 4,878,361. This application Aug. 26, 1989, Ser. No. 396,932
Int. Cl.[4] F25C *5/10*
U.S. Cl. 62—352 6 Claims

1. In an ice making system having a compressor, a condenser and an evaporator and having both a freeze cycle wherein a refrigerant is circulated from the compressor to the condenser through a discharge line and thereafter circulated to the evaporator and returned to the compressor through a supply line and a harvest cycle wherein a refrigerant is circulated from the compressor to the evaporator through the discharge line and a hot gas line and thereafter returned to the compressor through the supply line, a normally closed hot gas valve disposed between the compressor and the evaporator in the hot gas line, said hot gas valve being open during the harvest cycle to permit the flow of vaporous refrigerant therethrough, a check valve disposed between the condenser and the compressor, said check valve preventing the backflow of refrigerant from the condenser to the evaporator during the harvest cycle, a reservoir disposed between the compressor and the evaporator and communicating with the discharge line, means for condensing refrigerant in the reservoir during the freeze cycle,

said means for condensing refrigerant comprising a portion of the supply line which is cool during the freeze cycle and which is in thermal contact with a portion of the reservoir, and means for expelling the condensed refrigerant from the reservoir to



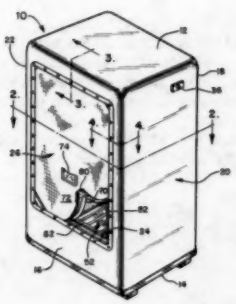
augment the amount of vaporous refrigerant circulating between the compressor and the evaporator during the harvest cycle, said expelling means comprising a surface which is warm during the harvest cycle and which is in thermal contact with a portion of the reservoir.

4,907,423

INSULATED REFRIGERATED STORAGE CONTAINER

Gary Hase, Beecher, Ill., assignor to H & R Industries, Inc., Beecher, Ill.

Filed Oct. 6, 1988, Ser. No. 252,676
Int. Cl.[4] F25D *3/12*
U.S. Cl. 62—384 **5 Claims**



1. An insulated refrigerated storage container apparatus comprising: a plurality of wall members defining a generally rectilinear enclosure and including respective top, bottom, front rear and opposing side wall members; a substantially rectangular access opening in said front wall; an access door mounted to said access opening in said front wall for selectively closing the same; a refrigerant compartment located interiorly of said enclosure and adjacent said top wall thereof, and means for directing the flow of refrigerated fluid from said refrigerant compartment over and around top, rear and bottom portions of the interior of said enclosure so as to substantially surround an interior volume defined within said enclosure with refrigerated fluid, and exhaust vent means located at a lower portion of said container for exhausting excess air and spent refrigerated fluid from said enclosure; wherein said access door comprises a flexible door member formed of a substantially rectangular sheet of pliable insulative material provided with an abrasion resistant backing, said backing being oriented to form an outer surface of the container when said door is closed, and means attaching said door along one edge thereof to a facing side of said access opening, and further including releasable closure means comprising a strip of releasable adhesive material running about the periphery of three other edges of said door facing said front wall member and a strip of complementary mating releasable adhesive material attached to facing surfaces of said front wall member about the other three sides of said access opening.

4,907,424

EARRING WITH REMOVABLE LOWER MEMBER

Beverly A. Reinstein, and Pamela L. Reinstein, both of 41 Beaumont Dr., Melville, N.Y. 11747

Filed Jan. 9, 1989, Ser. No. 295,123
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **6 Claims**

1. An earring comprising an upper member for attachment to an ear and a lower member for removable suspension from said upper member,

said upper member comprising a body having an inner surface for abutting engagement with the outer surface of the earlobe, a post means extending from said inner surface for supporting said lower member, and a clasp mounted on said inner surface beneath said post means;

said lower member having an upper end with an aperture formed therein to receive said post means to enable removable suspension of said lower member from said upper member, said aperture being only slightly larger than said post means;

said clasp being pivotable between a closed position in which said clasp extends upward to secure the earring on the ear, and an open position in which said clasp extends outward to permit removal of the earring;

said upper member further comprising biasing means acting when said clasp is in said closed position to oppose movement of said clasp out of said closed position;

said clasp further including means for cooperating with said post means to secure said lower member thereon so that said lower member cannot be removed from said post means when said clasp is in its closed position;

said clasp having a clamping portion means biased toward a predetermined location on said body of said upper member by said biasing means for clamping a wearer's earlobe thereagainst to support the earring, said post means being spaced beneath said predetermined location to avoid interference between said post means and the earlobe.

4,907,425

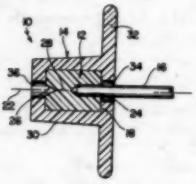
JEWELRY CLUTCH

Alfred A. Elkin, Pawtucket, R.I., assignor to Plastic Development, Inc., Pawtucket, R.I.

Filed Oct. 31, 1988, Ser. No. 264,774
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **3 Claims**

1. A jewelry clutch made by a method comprising the steps of molding a substantially solid inner gripping piece from an elastomeric, thermoplastic material having a Shore A durometer of between 30 and 90, said inner gripping piece having a gripping axis but initially being imperforate along at least a portion of said gripping axis, forming an outer casing around

said inner gripping piece, said outer casing having an opening therein which is aligned with said gripping axis, and inserting an elongated stud into said opening so that it penetrates the



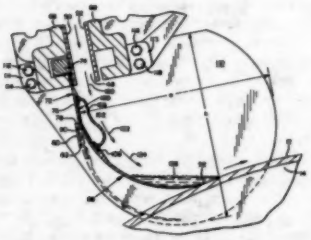
initially imperforate portion of said gripping piece along said gripping axis, said stud having a diameter of less than approximately 0.045 in.

4,907,426

METHOD AND APPARATUS FOR WASHING A POROUS MAT

Robert F. Wood, Portland, Oreg., and William R. Vanderveer, Vancouver, Wash., assignors to Fabcon, Inc., San Francisco, Calif.

Filed Sep. 11, 1987, Ser. No. 95,743
Int. Cl.[4] D06B *1/04*
U.S. Cl. 68—200 **21 Claims**



21. A shower for removing chemicals from a mat of material impregnated with chemicals, the mat being disposed over a portion of a porous moving surface with an outside surface of the mat exposed, the shower comprising:

liquid source means for directing a supply of washing liquid at the outside surface of the mat;

a substantially rigid, fiberglass stop plate mounted to the liquid source and projecting towards the mat across the width of the mat, the stop plate having a bottom edge; and

a concave, substantially rigid, fiberglass retainer hingedly mounted to the stop plate, the retainer having a proximal edge mounted to the stop plate above the bottom edge, and a distal edge that rests on the mat to deter liquid from flowing between the distal edge and mat for maintaining a body of washing liquid in contact with the outside surface of the mat;

a fabric hinge comprising a polytetrafluoroethylene fabric sheet having a first edge embedded in the plate and a second edge embedded in the retainer;

a plurality of safety cords connected between the retainer and the stop member; and

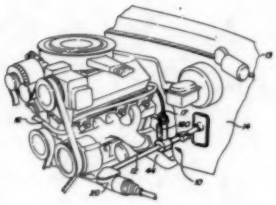
end walls fixedly mounted in relation to the stop member, the pulp mat, retainer and end walls together defining an arcuate trough.

4,907,427

STEERING WHEEL SHAFT LOCK ASSEMBLY

Ennels D. Armstrong, 21514 Dequindre, Apt. 204, Warren, Mich. 48091

Filed Dec. 27, 1988, Ser. No. 290,435
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—252 **16 Claims**



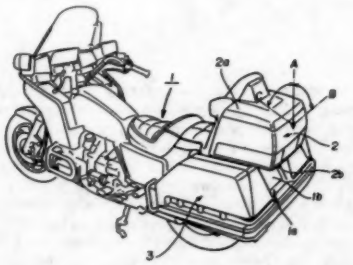
1. A steering wheel shaft lock assembly comprising: engagement means for mating engagement with an opening in a movable steering control mechanism; actuating means for selectively applying a force to move said engagement means towards mating engagement with the opening; and bidirectional biasing means operatively connected between said actuating means and said engagement means for biasing said engagement means towards engagement with the opening when said actuating means applies force thereagainst and said engagement means is unaligned with the opening and biasing said engagement means out of engagement with the opening when the force applied by said actuating means is selectively removed and the opening is applying a torque on said engagement means to retain said engagement means therein such that release of the torque disengages said engagement means.

4,907,428

CENTRALIZED LOCK DEVICE FOR VEHICLE STORAGE CONTAINER

Tai Nakashima, Tokyo, Japan, and Tadao Kitagawa, Worthington, Ohio, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,840
Claims priority, application Japan, Nov. 12, 1986, 61-270374
Int. Cl.[4] E05B *53/00*
U.S. Cl. 70—264 **8 Claims**



1. The combination comprising:

a plurality of storage containers;

a closure lid on each said storage container;

latch means on each said closure lid for releasably securing said lid to its associated container;

an operator for each said latch means and being remote therefrom, said operator including elongated cable means

operatively connected between said operator and said latch means;

selectively actuable control means operable in a first condition to render each said operator effective to release its associated latch means and operable in a second condition to render each said operator ineffective to release its associated latch means;

means operated by said control means interposed in said cable means for interrupting the connection between said operator and said latch means, said connection interrupting means including a swing mechanism comprising a pair of rotatably mounted plates; means on each of said plates for attaching respective ends of said cable means; and means for selectively connecting and disconnecting said rotary plates.

4,907,429

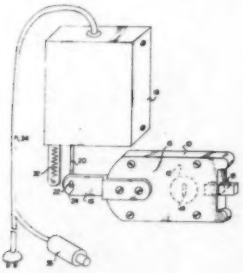
REMOTE CONTROLLED DOOR LOCK APPARATUS

Kenneth Davis, 166-26 Powells Cove Blvd., Whitestone, N.Y. 11357, and Norman Anderson, 2626 E. 28th St., Brooklyn, N.Y. 11235

Continuation-in-part of Ser. No. 453,754, Dec. 27, 1982, abandoned. This application Dec. 21, 1987, Ser. No. 136,028

Int. Cl.[4] E05B *47/00*

U.S. Cl. 70—279 **3 Claims**



1. An apparatus for use with a door lock mounted on a door having a hand lever and a key mechanism for moving a lock bolt of said door lock between a locked condition and an unlocked condition, comprising:

override means connected to said hand lever and said key mechanism for allowing said hand lever to override said key mechanism to lock and unlock said lock bolt, said hand lever having a first position in which said lock bolt is in its locked condition and a second position in which said lock bolt is in its unlocked condition

solenoid means including a coil with a movable magnetic core, and a linkage, said linkage being secured at one end to said core and at the other end to said hand lever, wherein said core, when no current flows through said solenoid means, is at its rest position so that said hand lever is in its first position, and wherein said core, when current flows through said solenoid means, moves to its operative position so that said linkage moves said hand lever to its second position; and

operator control means, disposed remotely from said door, connected by a conductor cable to said solenoid means and connected by plug means to a source of electrical energy, said operator control means including a mouthpiece switch located in close proximity to said mouthpiece, said switch being normally at a first, opened position at which current cannot flow from said source to said solenoid means and, when pressure from an operator exhaling through said mouthpiece is applied to said switch, said switch moves to a second, closed position at which current can flow from said source to said solenoid means,

whereby said operator control means and said solenoid means connected by said linkage to said hand lever are used to override said key mechanism to remotely unlock said lock bolt of said door lock by said operator exhaling through said mouthpiece at a position remote from said door.

4,907,430

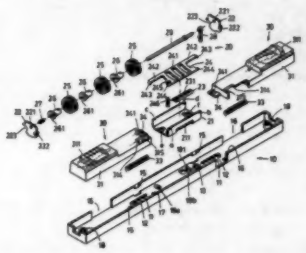
CENTRAL CONTROL CASE LOCK

Yan C. Hong, Chang Hua, Taiwan, assignor to Pao Tao Lock Ltd., Chan Hua, Taiwan

Filed Aug. 15, 1988, Ser. No. 232,215

Int. Cl.[4] E05B *37/02*

U.S. Cl. 70—312 **1 Claim**



1. A central control case lock comprising:

a parallelepiped housing having an open top, a bottom hole and a longitudinal side wall having two ends thereof respectively provided with two locking hook holes for respectively passing therethrough two locking hooks provided on a case cover of a case;

two locking mechanisms symmetrically received in two opposite ends of said housing, each locking mechanism including a sliding member having a retaining opening corresponding to one of said locking hook holes for retaining therein a corresponding locking hook, and an elastic element mounted on said sliding member for enabling said member to be slidable in said housing within a predetermined length; and

a numerical lock received in a central portion of said housing, including a base plate having two side plates respectively provided on two sides of said base plate, a pivoting shaft positioned between said side plates, a plurality of numbered wheels, a plurality of number changing cams each capable of being synchronously rotated with said wheels, a number-changing stem having a first end connected to said shaft and a second end passing through said bottom hole, and an actuating plate mounted beneath said wheels and having a free side edge capable of being set in a limited vertically pivoting movement with respect to a longitudinal axis thereof when actuated by said cams, wherein:

said sliding member integrally includes an engaging piece having a hole;

said free side edge has two engaging ends which extend therefrom, each having a tongue downwardly extending therefrom and an engaging portion engageable in said hole in order to lock in position said respective lock mechanism;

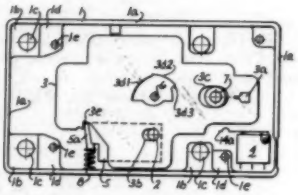
two longitudinal side walls of said housing respectively have top inner edges thereof provided with a plurality of engaging lugs for respectively engaging with top surfaces of two said sliding members; and

said housing further including two spaced bottom engaging lugs one of which forms at a top end thereof a hooking portion for engaging said numerical lock in position.

4,907,431
ADJUSTABLE LOCK

Guenter Mauer, Heiligenhaus, Fed. Rep. of Germany, assignor to Mauer GmbH, Heiligenhaus, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,566
Int. Cl.[4] E05B *65/12*
U.S. Cl. 70—355 **6 Claims**



1. Adjustable lock having an adjustment slide arranged in the bottom of a key housing, the slide being situated underneath the bolt element there being a number of tumbler devices with teeth which engage a blade carried by the above mentioned slide, the improvement comprising:

the bolt element being provided with a recess and an oblong slot;

a first stationary pin being mounted to the housing and traversing said oblong slot;

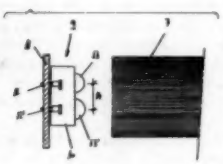
a bolt drive lever having its lower end mounted on said pin and being otherwise situated in said recess for translating key motion into a larger latch motion for the bolt, the bolt drive lever having a projection;

in addition to a bearing bore, a central part of the bolt drive lever is provided with a key control curve, the projection is provided on the drive lever which engages a U-shaped indent of said bolt, so that the bolt is moved on turning of the drive lever.

4,907,432
SAFETY DEVICE FOR A PRESS BRAKE OR SIMILAR MACHINE

Jean-Claude Mailliefer, Orny, Switzerland, assignor to Cybelec S.A., Yverdon-Les-Bains, Switzerland

Continuation of Ser. No. 114,401, Oct. 14, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 344,517
Claims priority, application Switzerland, Oct. 14, 1986, 4098/86
Int. Cl.[4] B21D *55/00*
U.S. Cl. 72—1 **12 Claims**



1. In a machine having an edge of a reciprocating punch operating in a danger zone that is formed by a gap of variable dimension between the edge of the punch and a surface of a work piece, the motion of the edge of the punch describing a plane, punch driving means of the machine having a characteristic stopping distance within which the approach of the punch to the work piece may be stopped in response to an unsafe condition, a safety device of the intangible barrier type comprising:

a light beam source emitting a light beam in a direction substantially transverse of the direction of motion of the punch, the beam being located in the vicinity of said plane and at a predetermined distance from said surface of a work piece, said predetermined distance having a magnitude between the thickness of a human finger and said characteristic stopping distance; and

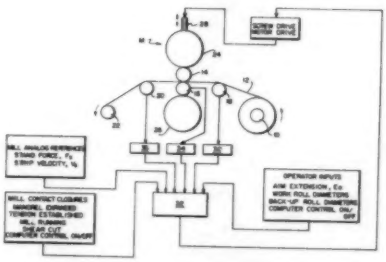
a receiver responsive to interruption of the light beam caused by motion of the punch,

the receiver comprising a speed measuring device for measuring the speed of the punch, the punch driving means being responsive to the speed measuring device, the speed measuring device causing interruption of the motion of the punch when the measured speed of the punch is greater than a predetermined speed.

4,907,433
APPARATUS AND METHOD FOR ADAPTIVE CONTROL OF A ROLLING MILL

Duane B. Larson, and Nick Korzow, Jr., both of Valparaiso, Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 18, 1988, Ser. No. 182,521
Int. Cl.[4] B21B *37/12*
U.S. Cl. 72—8 **29 Claims**



1. Apparatus for regulating the operation of a rolling mill having a material input, opposed work rolls and means for adjusting the spacing between the work rolls, and a material output, the apparatus comprising:

(a) velocity determining means for simultaneously determining the velocity of the material prior to, when between and subsequent to the work rolls;

(b) slip determining means operably associated with said velocity determining means for detecting input slip by comparing the speed of the material prior to and when between the work rolls and for detecting output slip by comparing the speed of the material subsequent to and when between the work rolls;

(c) first means operably associated with said slip determining means for calculating a velocity dependent factor when input slip exceeds output slip and for calculating a first derived factor when the calculated factor exceeds a previously calculated factor by more than the selected amount and for calculating a first adaptive parameter used to calculate the first derived factor when the calculated factor is less than the previously calculated factor by less than a selected amount;

(d) second means operably associated with said slip determining means for calculating the velocity dependent factor when the output slip exceeds input slip and for calculating a second derived factor when the calculated factor exceeds the previously calculated factor by more than a selected amount and for calculating a second adaptive parameter used for calculating the second derived factor when the calculated velocity dependent factor is less than

the previously calculated factor by less than the selected amount;

(e) averaging means operably associate with said first and second means for calculating an averaged velocity dependent factor from a selected number of the calculated and/or derived factors;

(f) error determining means operably associated with said averaging means for computing an error factor by comparing the averaged velocity factor with a target factor; and,

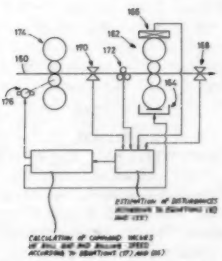
(g) control means operably associated with said error determining means and for operable association with the adjusting means for causing the spacing between the work rolls to be regulated in response to the error factor.

4,907,434

METHOD AND DEVICE FOR CONTROLLING STRIP THICKNESS IN ROLLING MILLS

Ikuya Hoshino; Hiroshi Kimura; Yukihiro Maekawa, and Takayuki Fujimoto, all of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Japan

Filed Oct. 4, 1988, Ser. No. 253,582
Claims priority, application Japan, Oct. 7, 1987, 62-253249
Int. Cl.[4] B21B *37/00*
U.S. Cl. 72—8 **5 Claims**



1. A method of controlling a thickness of a strip in a rolling mill which has a roll gap adjusting device for adjusting a roll gap of a given rolling stand of the mill, and a rolling speed adjusting device for adjusting a rolling speed of the strip, comprising the steps of:

detecting a variation of a roll force exerted on said given rolling stand, a variation of a thickness of said strip on an upstream side of said rolling stand, a variation of a thickness of said strip on a downstream side of said rolling stand, and a variation of a tension of said strip on said upstream side of said rolling stand;

classifying rolling environment disturbances received by said rolling mill into a first disturbance for which only said rolling speed should be compensated, a second disturbance for which only said roll gap should be compensated, and a third disturbance for which both said rolling speed and said roll gap should be compensated;

estimating values of said first, second and third disturbances, based on the detected variation of said roll force, the detected variation of the thickness of said strip on the upstream and downstream sides of said rolling stand, and the detected variation of said tension of said strip on said upstream side of said rolling stand; and

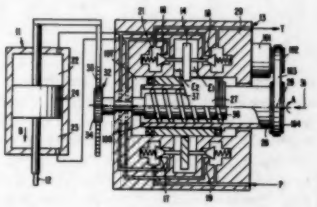
operating said roll gap adjusting device and said rolling speed adjusting device, depending upon the estimated values of said first, second and third disturbances, to thereby control the thickness of said strip, such that only said rolling speed is adjusted by said rolling speed adjusting device for said first disturbance, while only said roll gap is adjusted by said roll gap adjusting device for said second disturbance, and such that both said rolling speed and said roll gap are adjusted for said third disturbance.

4,907,435

SYSTEM FOR MONITORING THE POSITION OF A MACHINE COMPONENT

Eckehart Schulze, Stahlbühlstrasse 36, D-7251 Weissach, Fed. Rep. of Germany

Continuation of Ser. No. 921,611, Aug. 20, 1986, abandoned.
This application Feb. 27, 1989, Ser. No. 315,717
Int. Cl.[4] B21J *9/20*
U.S. Cl. 72—21 **11 Claims**



1. A system for monitoring positions of a machine tool component which carries out feed motions toward a workpiece and return motions away from the workpiece and for coarsely controlling the feed and return motions, comprising:

a hydraulic driving means for effecting the feed and return motions;

monitoring means for electrically-controlled presetting of desired positional values for the component and mechanical feedback of actual positional values of the component; and

a follow-up control apparatus operatively connected with the hydraulic driving means and the monitoring means, wherein valves are provided to be opened and closed to permit a pressure medium to be selectively delivered to the hydraulic driving means for moving the component in feed and return directions, valve actuating means for causing displacement of the valves in response to the preset desired values from a basic position in which the desired and actual positional values are the same to positions corresponding to the feed and return directions of the component, and proximity switch means having a deflectable actuating member for providing an output signal to said monitoring means, transmission means operatively coupled between said valve actuating means and said proximity switch means for transmitting displacements of said valve actuating means into deflections of the actuating member of said proximity switch means, the deflections being proportional to but larger than the displacements, said proximity switch means, when viewed in a direction of the deflection of the actuating member, is at a defined distance from a position occupied by the actuating member when said valve actuating means is in the basic position.

4,907,436

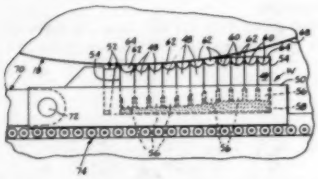
STEP FORGING PRESS

Myron I. Korytko, Erie, Pa., assignor to Efco, Inc., Erie, Pa.

Filed Oct. 11, 1988, Ser. No. 255,781
Int. Cl.[4] B21J *13/04*
U.S. Cl. 72—184 **14 Claims**

1. A forging press comprising a base, a pressure roller spaced from said base and in conjunction with the latter defining a pressure zone, means for conveying work between said base and said roller through said zone, said means including a plurality of discrete die segments coacting with confining means for confining said die segments and providing for formation by

said die segments of an associated work blank into a produced part during passage through said zone, said die segments including a roller pressure end and a molding end, and means on each die segment movably coacting with said roller pressure end and having a concave surface thereon adapted for disposal in confronting relation with said roller and movably coacting



with said roller pressure end, and adapted for generally complementary surface-to-surface mating relation with the confronting convex surface of said roller during movement of said work through said zone, whereby the part is smoothly forged from the associated work blank, said roller having a diameter which is larger as compared to the dimension of the defining chord of said concave surface of the last mentioned means.

4,907,437

UNIVERSAL ROLLING STAND WITH ROLLING RINGS SUPPORTED AS CANTILEVERS

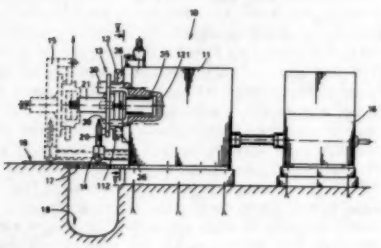
Alfredo Poloni, Ronchi Dei Legionari, and Fausto Drigani, Zugliano, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Nov. 23, 1987, Ser. No. 123,722

Claims priority, application Italy, Nov. 24, 1986, 83444 A/86

Int. Cl.[4] B21B *13/00, 31/04*

U.S. Cl. 72—225 **13 Claims**



1. In a universal rolling stand comprising a mill stand and horizontal rolling rings removably mounted on shafts supported as cantilevers on one side of said mill stand, the improvement comprising a pre-assembled and pre-positioned universal device removably mounted to said one side of said mill stand and comprising horizontal rolling rings, means to secure said horizontal rings onto said shafts, vertical rolling rings, and means to guide rolled stock.

4,907,438

SIZING MILL AND METHOD OF ROLLING A ROUND BAR MATERIAL

Takeshi Sasaki, Chita, and Kiyoharu Morita, Aichi, both of Japan, assignors to Daidotokushuko Kabushikikaisha, Japan

Filed Oct. 12, 1988, Ser. No. 256,428

Claims priority, application Japan, Oct. 30, 1987, 62-277211

Int. Cl.[4] B21B *13/12*

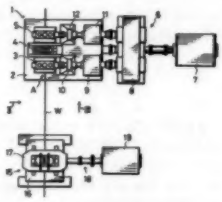
U.S. Cl. 72—235 **7 Claims**

1. A sizing mill including two roll stands arranged along a planned passage line of a roll material, each of said roll stands having

(a) a housing and

(b) a pair of rolls, each said roll having a groove on the circumferential surface thereof and rotatably mounted in said housing,

the axial direction of the rolls in one of said roll stands differing by 90 degrees from the axial direction of the rolls in the other of said roll stands;



the groove on each of said rolls having a bottom surface which is a circular arc in cross section, the size of said circular arc being determined such that the angle made by a line passing through the center and one end of said circular arc and a line passing through the center and the other end of said circular arc is in the range of 90 to 140 degrees, both side surfaces being, in cross section, circular arcs having a radius larger than that of the circular arc of said bottom surface.

4,907,439

ROLL STAND WITH SYSTEM FOR AXIALLY DISPLACEABLE ROLLS

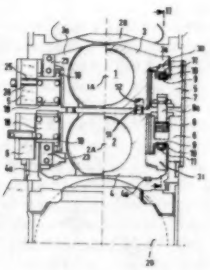
Hartmut Diel, Mönchen-Gladbach, and Hans-Heinrich Hartmann, Meerbusch, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,352

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1986, 3638330

Int. Cl.[4] B21B *31/18, 31/30*

U.S. Cl. 72—247 **7 Claims**



1. A roll stand comprising:

a frame;

a pair of upper guide members spaced apart on the frame along an upper axis and a pair of lower guide members spaced apart on the frame along a lower axis parallel to the upper axis;

guide formations between the members and the frame preventing the members from moving axially relative to the frame and permitting the members to move vertically in the frame;

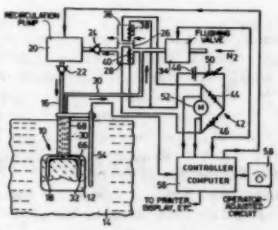
respective upper and lower journal blocks on the members;
respective guide formations between the blocks and the respective members preventing the blocks from moving vertically relative to the members and permitting the blocks to move axially on the members;
an upper roller carried between the upper journal blocks, axially coupled thereto, and rotatable thereon about the upper axis;
a lower roller carried between the lower journal blocks, axially coupled thereto, and rotatable thereon about the lower axis;
means braced between the guide members for relatively displacing the rolls and the respective journal blocks generally perpendicular to the axes between a use position with the axes relatively far apart and a service position with the rolls relatively closely spaced;
respective extensible and shortenable upper and lower hydraulic ram actuators each having a piston fixed to the respective guide member and a cylinder axially slidable on the piston; and
respective interengageable coupling formations on the cylinders of the actuators and on the journal blocks including downwardly and upwardly projecting and open flanges and grooves engageable in each other to couple each cylinder to the respective journal block only in the use position of the rolls, whereby in the service position the flanges are out of the respective grooves and the rolls can be moved axially independently of the actuators and in the use position the actuators can axially displace the rolls via the respective members and blocks relative to the frame.

4,907,440

PROBE FOR THE DETERMINATION OF GAS CONCENTRATION IN MOLTEN METAL

Jean-Pierre Martin, Chicoutimi-Nord; Ghyslain Dube, and Don A. Doutre, both of Jonquiere, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed May 27, 1988, Ser. No. 199,673
Claims priority, application Canada, May 28, 1987, 538309
Int. Cl.[4] G01N *7/10*
U.S. Cl. 73—19 **41 Claims**



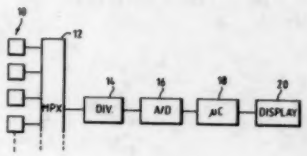
1. An immersion probe for determination of the concentration of a gas dissolved in molten metal by immersion of the probe in the molten metal and recirculation of a carrier gas through the probe to establish an equilibrum mixture of the carrier gas and said dissolved gas, the probe comprising:
a probe body consisting of a block of a gas-permeable, liquid-metal-impervious material of sufficient heat resistance to withstand immersion in the molten metal;
the body having a gas inlet to its interior, and a gas outlet therefrom;
the gas inlet and outlet being spaced from one another so that gas passing from the inlet to the outlet traverses a substantial portion of the probe body interior for entrainment of said dissolved gas diffusing to the interior of the body from the ambient molten metal;
the material of the probe body having a porosity of from 5% to 80%, a permeability of from about 2 to about 2,000 Darcies, and a pore size of from 0.5 micrometers to 2,000 micrometers.

4,907,441

APPARATUS AND METHOD FOR IDENTIFYING OR MEASURING GAS OR LIQUID BORNE SUBSTANCES

Harold V. Shurmer, Rugby, England, assignor to National Research Development Corporation, London, England

Filed Aug. 26, 1988, Ser. No. 236,936
Int. Cl.[4] G01N *31/00*
U.S. Cl. 73—23 **10 Claims**



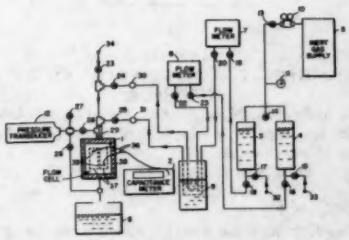
1. Apparatus for identifying, detecting or measuring gas or liquid borne substances, comprising:
a plurality of sensors arranged for simultaneous exposure to a sample to be analyzed, and
electrical circuit means associated with the sensors and arranged to compensate for non-linear output versus substance concentration characteristics of the sensors, whereby each sensor, in combination with the circuit means, is operable to generate an electrical signal having a characteristic which is linearly related to the concentrations of a plurality of substances sensed by said each sensor, the circuit means including means for processing said electrical signals from said plurality of sensors to produce an electrical output indicative of an identity of the sample to be analyzed sensed by the sensors or of the presence and/or concentration of a particular substance or substances within said sample to be analyzed.

4,907,442

METHOD AND SYSTEM FOR DETERMINING FLUID SATURATIONS WITHIN NATURAL OR SIMULATED FRACTURES

Timothy A. Jones, Carrollton, and Thomas J. Kaluza, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,593
Int. Cl.[4] G01V *3/38*; G01N *5/02*
U.S. Cl. 73—38 **21 Claims**



14. A system for determining fluid saturation within a fracture of a fractured material having at least a first and second fracture face, comprising:
(a) a flow cell for mounting the fractured material therein;
(b) means for measuring the capacitance between the fracture faces; and

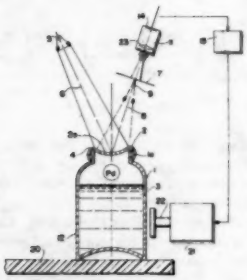
(c) means for providing a regulated flow of test fluid.

4,907,443

PROCESS AND APPARATUS FOR MONITORING THE PRESSURE PREVAILING IN A VESSEL OR RECEPTACLE

André Pailler, Miribel, France, assignor to Mutec Ingenierie, Caluire, France

Filed Sep. 28, 1988, Ser. No. 250,089
Claims priority, application France, Sep. 29, 1987, 87 13697
Int. Cl.[4] G01N *21/00*; G01L *9/00*
U.S. Cl. 73—52 **13 Claims**



1. A process for monitoring pressure prevailing in a vessel delimited by a rigid exterior wall in which a substantially flat monitoring member is provided which is adapted to curve through the action of a difference in pressure between the interior of said vessel and the outside, comprising:

(a) directing an incident light beam onto the monitoring member, thereby producing a monitoring light beam emitted from the monitoring member;

(b) training the monitoring light beam on a diffusing support located at or near a reference focal point determined by a pre-established value of a difference in pressure between the interior of the vessel and the outside, to form a spot of light on the diffusing support; and

(c) receiving an image formed by the spot of light in at least one dimension of said spot on the other side of the diffusing support in relation to the monitoring member and producing from said image a video signal representing the pressure prevailing in said vessel.

4,907,444

FIRE FIGHTING FOAM ANALYZER AND METHOD THEREFOR

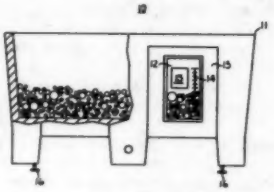
Martin J. Marx, 5560 Marcliffe Ave., Boise, Id. 83704; Mark A. Harper, and Todd D. Halter, both of Boise, Id., assignors to Martin Marx, Boise, Id.

Filed Nov. 25, 1988, Ser. No. 276,224
Int. Cl.[4] G01N *33/00*
U.S. Cl. 73—60.1 **5 Claims**

1. A fire fighting foam analyzer which comprises:

a multi-gallon capacity container of known volume having at least one vertical wall, for receiving fire fighting foam and determining initial foam to final solution ratios; and

a transparent window disposed in said wall having a first visual indicia means thereon defining volume graduations for indicating the volumes of the initial foam and final solution within said multi-gallon capacity container at any particular level and further having a ratio to foam type correlating indicia thereon for correlating an initial foam



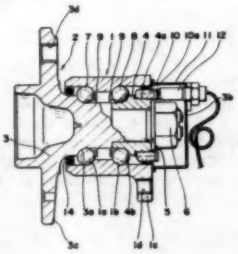
to final solution ratio to a particular fire fighting foam type.

4,907,445

AUTOMOBILE WHEEL BEARING UNIT

Tsuyoshi Okumura, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 28, 1988, Ser. No. 291,303
Claims priority, application Japan, Dec. 28, 1987, 62-333752
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 **6 Claims**



1. An automotive vehicle wheel bearing unit comprising:

a cylindrical external member having an outer flange through which the cylindrical external member is to be attached to a chassis of an automotive vehicle;

an internal member having a flange at one end thereof to which a wheel of an automotive vehicle is to be attached, said internal member extending within said external member in an axial direction of the unit;

rolling elements and a cage spacing said rolling elements apart interposed between said cylindrical external member and said internal member, said rolling elements rotatably supporting said internal member relative to said external member;

a nut secured to the other end of said internal member and mounting the internal member to said external member via said rolling elements;

a sealing member fixed to said cylindrical external member and covering said nut;

an annular body extending around said internal member adjacent said nut and fixed relative to said internal member so as to rotate in conjunction therewith, said annular body having a rear surface lying in a plane perpendicular to the axial direction of the unit and facing away from said internal member, and a plurality of projections extending radially along said rear surface and disposed at uniform intervals in the circumferential direction of the annular member; and

rotational detector means for detecting the rotational speed of said annular member, said rotational detector means

having a front end and a rear end, and said rotational detector means being fixed to said sealing member at said rear end thereof and extending in the axial direction of the unit between an inner peripheral surface of said sealing member and an outer peripheral surface of said nut, the front end of said rotational detector means confronting a respective location past which location said plurality of projections travel when said annular body is rotated in conjunction with said internal member.

4,907,446

FLOW SENSOR INCORPORATING A THERMORESISTOR

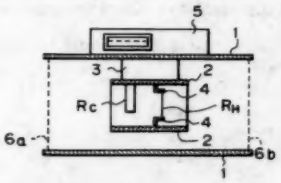
Masanori Inada; Naruki Suetake; Hichiro Ohtani, and Tomoya Yamakawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,110

Claims priority, application Japan, Feb. 24, 1988, 63-23335[U]; Apr. 19, 1988, 63-53420[U]

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118.2 **10 Claims**



1. A thermal flow sensor constructed by a temperature control circuit which includes a bridge circuit consisting of a thermoresistor arranged in a fluid passageway and a plurality of resistors and controls a current which is supplied to said thermoresistor so that the bridge circuit keeps a predetermined thermal equilibrium state, in which the sensor measures by detecting a flow rate of a fluid flowing the passageway on the basis of the thermal equilibrium state, said sensor comprising:

a subtracting circuit for subtracting a predetermined voltage from an output voltage of said temperature control circuit which is obtained from a terminal voltage across a resistor connected serially with the thermoresistor in said bridge circuit;

a voltage dividing circuit for dividing an output voltage of said subtracting circuit; and

an arithmetic operating circuit for performing either an addition or a subtraction between an output voltage of said voltage dividing circuit and the output voltage of the temperature control circuit,

wherein the output voltage of the temperature control circuit is corrected in accordance with a gradient of a flow rate detecting characteristic and the corrected output voltage is output from said arithmetic operating circuit.

4,907,447

APPARATUS FOR MARKING HIGH POINT MARK ON TIRE

Masami Tanaka, and Masataka Nagasawa, both of Kodaira, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 17, 1988, Ser. No. 195,065

Claims priority, application Japan, May 20, 1987, 62-121009

Int. Cl.[4] E01C *23/00*

U.S. Cl. 73—146 **7 Claims**

1. An apparatus for making a high point mark on a sidewall of tire at a peak position of a primary waveform of a radial force variation (RFV) of the tire comprising:

rotating means for rotating a tire;

reference pulse generating means for generating a reference pulse in synchronism with the rotation of the tire;

processing means for generating first pulses the number of which corresponds to an angle over which said tire must be rotated from an instant at which said reference pulse is generated by said reference pulse generating means to an instant at which the peak position of RFV thereof reaches a marking position;

pulse generating means for generating second pulses whose repetition frequency is proportional to a rotational velocity of the tire as rotated by said rotating means;

servo control means comprising a counter which initiates, in response to said reference pulse, a count of said first pulses supplied from said processing means and said second pulses supplied from said pulse generating means in an up and down counting manner to produce a difference count value therebetween, and a digital/analog converter for converting the difference count value produced by said counter to an analog signal by means of which said rotating means is controlled; and

marking means for marking a high point mark at the peak position of RFV on the sidewall of the tire, said tire being stopped at the marking position when said difference count value of the counter becomes zero.

4,907,448

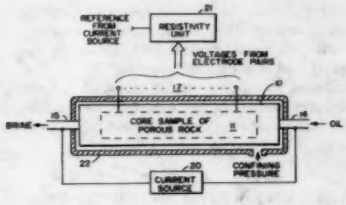
APPARATUS FOR MEASURING RESISTIVITY OF POROUS ROCK

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,745

Int. Cl.[4] E21B *49/02*

U.S. Cl. 73—153 **8 Claims**



1. Apparatus for measuring resistivity at a plurality of positions along the surface of a core sample of a porous rock under confining pressure and varying water saturations, comprising:

(a) a sleeve containing a core sample of a porous rock saturated with a first fluid,

(b) a fluid inlet positioned in a first end of said sleeve through which a second fluid is injected under pressure into a first end of said core sample for displacing said first fluid from a second end of said core sample, said second fluid being

immiscible with said first fluid and of opposite electrical conductance,

(c) a porous member positioned adjacent a second end of said core sample within said sleeve, and which is permeable to said first fluid and impermeable to said second fluid,

(d) a fluid outlet positioned in a second end of said sleeve through which said first fluid is discharged from said sleeve after having been displaced from the second end of said core sample through said porous member,

(e) a plurality of electrodes extending through said sleeve and making contact with said core sample at a plurality of spaced apart positions along the length of the core sample,

(f) means for passing a current through said core sample,

(g) means for applying a confining pressure through said sleeve to said core sample, and

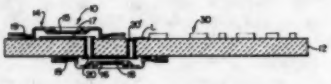
(h) means connected to said electrodes for measuring resistivities between adjacent pairs of said electrodes in response to the flow of said current through said core sample at said confining pressure as said second fluid displaces said first fluid from said core sample.

4,907,449

METEOROLOGICAL DATA ENCODER FOR MEASURING ATMOSPHERIC CONDITIONS

David B. Call, Boulder; James A. Nolan, Evergreen, and Steven J. Lassman, Boulder, all of Colo., assignors to A.I.R., Inc., Boulder, Colo.

Filed Oct. 31, 1986, Ser. No. 926,361
Int. Cl.[4] G01W *1/04*; G01L *9/12*; G01R *27/26*
U.S. Cl. 73—170 R **18 Claims**



15. In a radiosonde wherein a variable capacitance, pressure responsive transducer includes a non-conductive substrate having metal diaphragms hermetically secured to opposite surfaces of said substrate in overlapping spaced relationship to a respective fixed capacitor on said opposite surfaces, the improvement comprising:

said diaphragms having peripheral boundaries disposed in offset but partially overlapping relation to one another and said plates disposed in offset but partially overlapping relation to one another, a first conductor extending through said substrate electrically interconnecting overlapping portions of said plates, a portion of one of said plates extending along one of said opposite surfaces beyond the peripheral boundary of said diaphragm on the other of sad opposite surfaces, and a second conductor extending from said portion into communication with the other of said opposite surfaces; and

an electronic measuring circuit mounted externally of said transducer including an external lead connecting said electronic measuring circuit to said second conductor.

4,907,450

LOCKABLE WATER METER EXPANSION CONNECTION AND METHOD

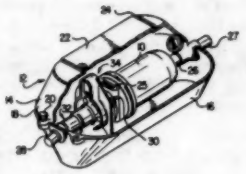
James W. Bednarz, 1025 W. Crosby, Slaton (Lubbock), Tex. 79364

Filed Sep. 22, 1988, Ser. No. 247,955
Int. Cl.[4] G01F *15/18*
U.S. Cl. 73—201 **42 Claims**

1. A fluid tight expansion connection for connecting a first threaded fluid carrier to a second fluid carrier, comprising:

a threaded packer threadable onto the first fluid carrier; and

a hollow expansion tube dimensioned to slidably receive said packer and to connect the first threaded fluid carrier to the second fluid carrier when said expansion tube and said threaded packer are turned in a direction opposite said



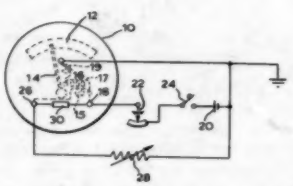
threading while the first threaded fluid carrier is held in place.

4,907,451

LIQUID LEVEL INDICATING DEVICE

Nicholas R. Fleetham, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 24, 1988, Ser. No. 211,003
Claims priority, application United Kingdom, Jun. 26, 1987, 87105083
Int. Cl.[4] G01F *23/18*; H01H *35/18*
U.S. Cl. 73—291 **9 Claims**



1. A vehicle mounted liquid level indicating device, electrically connected to a liquid level sensor that is located within a liquid containing tank and has electrical characteristics which vary in correspondence to changes in the level of liquid within the tank, comprising:

an air core meter movement gauge having a first set of inductive coils for receiving a reference electrical current from a source of electrical energy and producing a first electromagnetic field, a second set of inductive coils oriented to produce a second electromagnetic field oriented orthogonally with respect to the field generated by said first set of inductive coils and connected to said source of electrical energy and to said liquid level sensor and;

a normally closed tilt switch located between said source of electrical energy and said first and second sets of inductive coils for interrupting the supply of electrical current to said gauge whenever said vehicle is subjected to acceleration or deceleration forces greater than a predetermined amount or said vehicle becomes oriented in a non-level condition with respect to the horizontal beyond a predetermined limit.

4,907,452

SYSTEM FOR DETECTING ROTATIONAL IMBALANCE OF VEHICLE ROADWHEELS

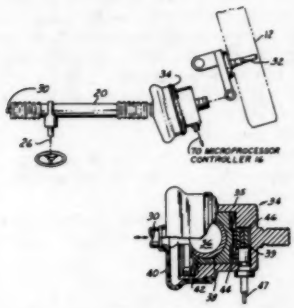
W. Trent Yopp, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,531
Int. Cl.[4] G01M *1/28*
U.S. Cl. 73—457 **12 Claims**

1. A system for detecting rotational imbalance of a steerable roadwheel of a vehicle, comprising:

force measurement means for sensing the force required to

steer said roadwheel, with said means further comprising means for generating a force signal corresponding to said sensed force; and



processor means responsive to said force signal for determining the dynamic rotational balance condition of said roadwheel.

4,907,453

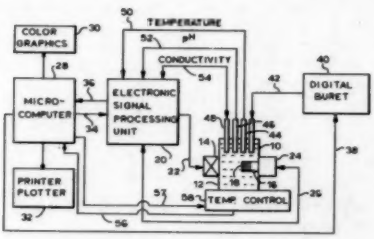
COLLOID ANALYZER

Bruce J. Marlow, Carmel; Tonis Oja, Scarsdale, and Philip J. Goetz, Katonah, all of N.Y., assignors to Pen Kem, Inc., Bedford Hills, N.Y.

Continuation of Ser. No. 879,342, Jun. 27, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,822

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—584 **16 Claims**



1. Apparatus for analyzing colloids comprising: a chamber for storing the colloid being analyzed, transducer means adapted to generate a continuous acoustic wave signal at a predetermined frequency for acoustically exciting the colloid stored in the chamber, means for sensing the colloid vibration potential of said acoustically excited colloid in said chamber, and means responsive to said sensing means wherein said sensing means comprises antenna means and hydrophone means responsive to the acoustic excitation generated by said transducer means in said colloid, and said means responsive to said sensing means comprises means responsive to said antenna means, said hydrophone means and said transducer means to generate an output signal related to both the magnitude and polarity of the zeta potential of said acoustically excited colloid, and wherein said means responsive to said sensing means comprises phase comparison means alternatively coupled to the output of said antenna means and said hydrophone means, said phase comparison means also being coupled to means for generating the sin and cos of an electrical reference signal having the same frequency as the acoustic excitation signal generated by said transducer means, wherein the output of said phase comparison means comprises information relating to both the magnitude and polarity of the zeta potential of the acoustically excited colloid.

4,907,454

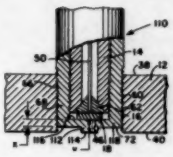
ULTRASONIC TRANSDUCER

Dov Hazony, University Heights, and Richard E. Berris, Jr., Chagrin Falls, both of Ohio, assignors to J. W. Harley, Inc., Twinsburg, Ohio

Continuation-in-part of Ser. No. 25,943, Mar. 16, 1987, Pat. No. 4,757,713. This application Jul. 14, 1988, Ser. No. 219,076

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—597 **4 Claims**



1. An ultrasonic transducer device for measuring the thickness of a member comprising a piezoelectric element, means for biasing said piezoelectric element against the member whose thickness is to be measured, said biasing means comprising a sleeve having a recess provided in one end thereof and spacer means received within said recess in said sleeve, said spacer means operatively contacting said piezoelectric element, and means for producing a reference thickness, said reference thickness producing means being a surface formed within the member whose thickness is to be measured and positioned opposite said piezoelectric element, said surface being substantially parallel to a wear surface the member whose thickness is to be measured, said reference thickness producing surface and said wear surface intercepting signals produced by said piezoelectric element in response to actuation thereof, said reference thickness producing means being responsive to changes in the temperature of the member whose thickness is to be measured.

4,907,455

CERAMIC DELAY LINES FOR HOT ULTRASONIC EXAMINATION

William E. Lawrie, Concord, Va., and Daniel R. Petrak, Midland, Mich., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 25, 1988, Ser. No. 198,409

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—644 **3 Claims**

1. An apparatus for the ultrasonic inspection of a workpiece at a high temperature, comprising:

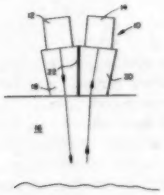
a first transducer including an ultrasonic pulse generating source;

a second transducer for receiving ultrasonic pulses reflected from the workpiece being inspected;

a first coupling means interposed between said first transducer and the workpiece being inspected; and

a second coupling means interposed between the workpiece being inspected and said second transducer, said first and second coupling means being formed by hot pressing a composition of silicon nitride and boron nitride, the composition having boron nitride platelets oriented substantially perpendicularly to the direction of the hot pressing, said first and second coupling means being oriented so that the boron nitride platelets in the composition are substan-

tially parallel to the direction of propagation of the ultrasonic pulses produced by said pulse generating source and



to the direction of propagation of said ultrasonic pulses reflected from the workpiece being inspected.

4,907,456

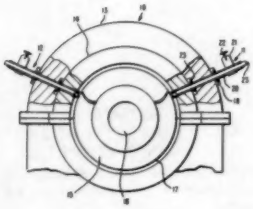
SENSOR PROBE SYSTEM

Paul F. Rozelle, Fern Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1988, Ser. No. 172,614

Int. Cl.[4] G01H *11/00*

U.S. Cl. 73—660 **11 Claims**



1. A method for measuring vibration in turbine blades in which a guide tube is sealedly mounted through the outer and inner cylinder covers of a turbine and extends to a position adjacent the tip of the turbine blades and in which the guide tube is sealed at the cylinder covers and has a gate valve external of said turbine cylinder covers, comprising the steps of:

removing a dummy probe to a location intermediate the gate valve and the external opening of the guide tube while the turbine is in operation, the dummy probe being dimensioned to sealedly engage the interior of the guide tube to prevent escape of fluids from the turbine;

closing the gate valve;

removing the dummy probe completely from the guide tube;

inserting a vibration sensor probe into said guide tube to said location, the sensor probe being dimensioned to sealedly engage the interior of the guide tube to prevent escape of fluids from the turbine;

opening the gate valve;

inserting the sensor probe into the guide tube until a shoulder on the sensor probe rests on a positioning shoulder within the guide tube to permit the sensor probe to be placed adjacent the blades;

measuring vibration in the blades during operation of the turbine, whereby vibration in the blades can be measured during operation of the turbine without interfering with the operation of the turbine by replacing the dummy probe with the sensor probe;

at the completion of said measuring, withdrawing the sensor probe to said location;

closing the gate valve;

removing the sensor probe from the guide tube completely;

re-inserting the dummy probe to said location;

opening the gate valve; and

inserting the dummy probe into the guide tube until a shoulder on the dummy probe rests on the positioning shoulder within the guide tube.

4,907,457

METHOD OF EVALUATING RESIDUAL LIFE OF HEAT-RESISTANT STEEL

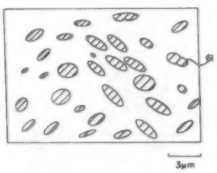
Nobuhiko Nishimura; Fujimitsu Masuyama, both of Nagasaki, and Tetsuro Sada, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,002

Claims priority, application Japan, Jul. 27, 1987, 62-185542; Oct. 9, 1987, 62-254929

Int. Cl.[4] G01N *21/00*

U.S. Cl. 73—787 **4 Claims**



1. A method of evaluating the residual life of a heat-resistant steel after service at high levels of temperature and stress comprising: measuring the density of an alloy element in a tiny region of each of a multiplicity of measuring spots on the surface of said heat-resistant steel; and obtaining a prediction value of said residual life by locating the data concerning the measured values of density of said alloy element on a residual life evaluation reference diagram which has been beforehand obtained and which represents the relationship between the density of said alloy element and the life consumption as obtained through a non-destructive test or a stress analysis on many pieces of said heat-resistant steel used under various conditions.

4,907,458

PULL TESTING

Kenneth L. Biggs, 3407 N. Valley View, Orange, Calif. 92667, and C. Fredrick Miller, 1551 E. Pacifico, Anaheim, Calif. 92805

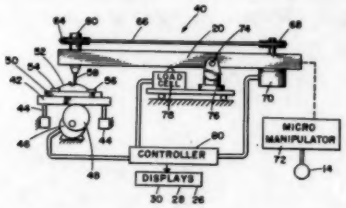
Filed Dec. 9, 1987, Ser. No. 130,308

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—827 **9 Claims**

1. The method of testing the ability of a wire bond between a wire and a bond point to withstand being pulled, which method comprises the steps of:

placing a hook under the wire;
maintaining the position of the hook substantially fixed;

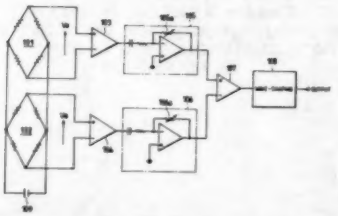


pulling said bond point away from said position while measuring the magnitude of the pulling force applied to the hook.

4,907,459
VORTEX FLOW METER

Yasuo Tada, and Akinori Akazawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,242
Claims priority, application Japan, Mar. 15, 1988, 63-34781; Oct. 6, 1988, 63-131086
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 **4 Claims**

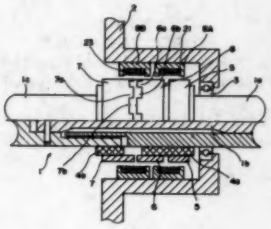


1. A vortex flow meter, comprising:
a vortex generator provided in a conduit through which a fluid to be measured flows;
first and second pressure takeout ports for picking up the pressure of Karman vortices generated in the fluid downstream of said vortex generator in said conduit;
first, second, third and fourth pressure chambers;
a first pressure passage for transmitting a first pressure change caused at said first pressure takeout port to said first and fourth pressure chambers;
a second pressure passage for transmitting a second pressure change caused at said second pressure takeout port to said second and third pressure chambers;
a first diaphragm provided between said first and second pressure chambers for detecting the difference in the pressure of said karman vortices;
a second diaphragm provided between said third and fourth pressure chambers for detecting the difference in the pressure thereof;
first and second bridge circuits for generating an output in response to the action of said first and second diaphragms, respectively;
first and second variable amplifiers for receiving the output from said first and second bridge circuits;
a differential amplifier for differentially amplifying the outputs from said first and second variable amplifiers, inverse each other to in polarity and nearly equal to each other in magnitude to generate an output representing the period of a pulsation which takes place along with the generation of said vortices; and
first and second adjusting resistors provided in said first and second variable amplifiers for adjusting the amplification factors of said first and second variable amplifiers, respectively, to equalize the outputs from said first and second variable amplifiers to each other.

4,907,460
TORQUE SENSOR

Manabu Taniguchi; Hidenobu Nagano; Toshihiko Daido; Isao Kuramoto; Makoto Nohara, and Hirochika Kyotani, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jul. 26, 1988, Ser. No. 224,538
Claims priority, application Japan, Oct. 30, 1987, 62-167137; Nov. 26, 1987, 62-299593[U]; Dec. 25, 1987, 62-198734; Mar. 25, 1988, 63-72270[U]; Mar. 25, 1988, 63-72269[U]; Mar. 25, 1988, 63-39842; Apr. 22, 1988, 63-54841
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.33 **20 Claims**



18. A method of sensing torque, comprising the steps of:
detecting changes in a magnetic coupling state which is indicative of variations in temperature and torque between first and second cylinders connected through a torsion bar, said magnetic coupling state being variable due to variation in said torque through relative rotation of the shafts with respect to each other, and
compensating the detected changes in the magnetic coupling state for variations in temperature in response to a magnetic coupling state which is invariable to variations in the torque, the compensated detected changes in the magnetic state thereby corresponding to variations in the torque only.

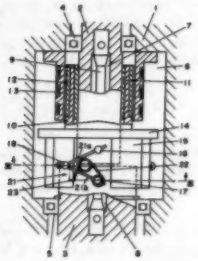
4,907,461
TORQUE SENSOR

Kunihiko Eto; Shirou Takeuchi, both of Toyota, and Yasuo Shiba, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 24, 1989, Ser. No. 314,964
Claims priority, application Japan, Feb. 26, 1988, 63-42213
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.33 **8 Claims**

1. A torque sensor comprising:
a driving shaft held such that it can make only rotary motion about an axis;
a driven shaft held such that it can make only rotary motion about the axis;
a sleeve cylinder fitted over one of the shafts around its axial end opposite to the other shaft such that the cylinder can be rotated and axially displaced;
means for detecting the axial displacement of the cylinder;
a plurality of connector members inclined in opposite directions about a direction perpendicular to the axis within a plane parallel to the axis, one end of each of the connector members being mounted to the sleeve cylinder, the other

ends of the connector members being mounted to the opposite axial ends of the shafts, respectively; and



biasing means for rotating the sleeve cylinder relative to one of the shafts to apply a tensile force to the connector members.

4,907,462

TORQUE SENSOR

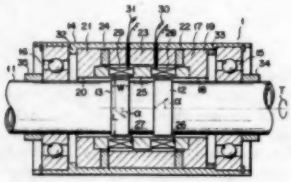
Masao Obama, Yokosuka, and Masaaki Kikuchi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 18, 1989, Ser. No. 298,012

Claims priority, application Japan, Jan. 22, 1988, 63-12014

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **23 Claims**



1. A torque sensor of a noncontact type for sensing a rotary torque applied to a shaft having an axis, the sensor comprising:

a first magnetic ribbon fixed to the shaft along the circumferential direction of the shaft, said ribbon comprising a magnetic material having an induced magnetic anisotropy in a direction of an angle α in respect to the axis of the shaft;

means for generating an alternating magnetic field along the shaft and applying the magnetic field to said magnetic ribbon;

means for generating a constant biasing magnetic field along the shaft and applying the biasing magnetic field to said magnetic ribbon; and

means for detecting the magnetic fields passing through said magnetic ribbon to generate an output signal.

4,907,463

LINEAR DISPLACEMENT SAMPLING VALVE AND A DEVICE FOR FIXING SAME

Henri Champseix, Montesson, and Serge Champseix, Les Mureaux, both of France, assignors to ABX, Sartrouville, France

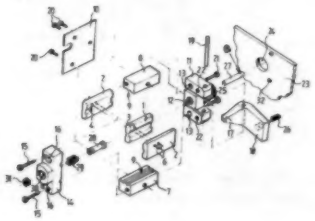
Filed Oct. 28, 1988, Ser. No. 263,810

Claims priority, application France, Oct. 30, 1987, 87 15045

Int. Cl.[4] G01N *1/10*; F16K *11/065*

U.S. Cl. 73—863.73 **12 Claims**

1. In a linear displacement sampling valve and a device for fixing the elements thereof formed essentially by a central mobile element with at least one transverse passage orifice and adapted for effecting a sliding movement under the action of a drive means of the cylinder and piston kind, so that the transverse orifice is aligned with one or the other of several opposite orifices provided on fixed guide parts placed on each side of said central element, said central sliding element and its two fixed lateral guide parts are profiled and chamfered so as to



have bearing faces with a reduced friction area and form a substantially parallelepipedic assembly which is held in position on four of its faces by fixed members forming a cradle therefor, and which is held in position on a fifth face thereof by a manual release locking flange and on its sixth face by a clamping member of the quick release pivoting type.

4,907,464

COAXIAL STARTER

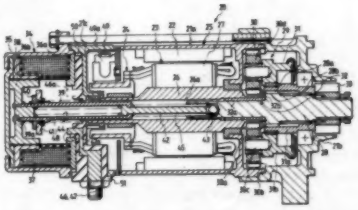
Shuzoo Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 251,644

Claims priority, application Japan, Oct. 1, 1987, 62-248429; Oct. 1, 1987, 62-248430; Oct. 7, 1987, 62-252983

Int. Cl.[4] F02N *15/06*

U.S. Cl. 74—7 A **7 Claims**



1. A coaxial starter, comprising:

a motor having a tubular armature shaft, an armature core, an armature, and a commutator, said armature and said commutator being attached to said tubular armature shaft, said tubular armature shaft being provided with an inside path thereof and a front end surface thereof perpendicular to an axial direction thereof;

an output shaft arranged at the front end side of said motor and having one end provided with a pinion disengageably engaged with a ring gear of an engine and the other end inserted into said inside path of said tubular armature shaft so as to be axially slidable, said output being provided with a large-diameter portion having a rear end surface thereof;

a driving power transmission device having an overrunning clutch for transmitting rotation force of said armature shaft through said overrunning clutch to said output shaft;

a bearing provided between said front end surface of said armature shaft and said rear end surface of said large-diameter portion of said output shaft;

an electromagnetic switching unit proivded on a rear end

side of said motor for energizing said motor and for sliding said output shaft; and

wherein said tubular armature shaft is provided with a large-diameter concavity formed on an inner circumferential portion at the front end side of said armature shaft, and said bearing is formed by a tubular member which is inserted into said large-diameter concavity and longer in the axial direction than said large-diameter concavity so as to project from the front end surface of said tubular armature shaft.

4,907,465

CHANGE SPEED CONTROL STRUCTURE FOR HYDRAULIC TRANSMISSION

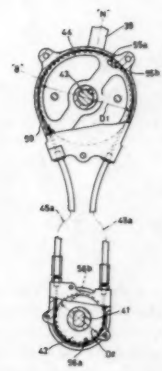
Satoshi Machida, Sennan; Shigekazu Hasegawa, Sakai; Yoshimi Ota, Osaka, and Muneji Okamoto, Sakai, all of Japan, assignors to Kubota Ltd., Osaku, Japan

Filed Nov. 12, 1987, Ser. No. 119,795

Claims priority, application Japan, Nov. 10, 1986, 61-267174; Dec. 17, 1986, 61-302369; Dec. 17, 1986, 61-302366; Dec. 24, 1986, 61-310590

Int. Cl.[4] B60K *17/02, 20/02, 20/12*

U.S. Cl. 74—89.2 **6 Claims**



1. A change speed control structure for a hydraulic transmission having change speed hydraulic actuator means, comprising:

a rotary valve for controlling said change speed hydraulic actuator means,

shift lever means including a shift lever body and a guide groove for guiding the shift lever body,

said guide groove including a first straight portion, a second straight portion and a third straight portion extending parallel to one another in series and offset in a transverse direction thereof, a first bight portion interconnecting an end of the first straight portion adjacent the second straight portion and an end of the second straight portion adjacent the first straight portion, a second bight portion interconnecting an end of the second straight portion adjacent the third straight portion and an end of the third straight portion adjacent the second straight portion, and an upper end, each of the straight portion including a plurality of serially increased change speed positions, and the speed positions of said second straight portion being serially higher than the speed positions of said first straight portion and the speed positions of said third straight portion being serially higher than the speed positions of said second straight portion, and

a relay assembly for transmitting movements of said shift lever body to said rotary valve.

4,907,466

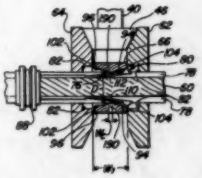
KEY SHIFT TRANSMISSION

John B. Kuhn, Rubicon, Wis., assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 944,089, Dec. 22, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 237,666

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—378 **29 Claims**



1. A key shift transmission comprising:

a housing;

a driving input shaft, operatively positioned in said housing, having an input drive pinion operatively connected to one end thereof;

a driven shaft having at least one groove formed therein;

at least one forward and one reverse gears each having at least one key receiving means, each of said gears being operatively connected to said driven shaft;

at least one key having a tip and a base forming edges for selectively engaging said key receiving means, said key being operatively positioned in said groove;

means, operatively connected to said driven shaft, for shifting said key in said groove such that said key selectively engages said key receiving means; and

a neutral collar, operatively positioned on said driven shaft between said forward and said reverse gears, for reducing wear on the radially outermost portion of said key tip, thereby extending the life cycle of said key, said collar having an internal cross section relatively thickest at its center and sloped internal surfaces from said center to each end thereof, said sloped surfaces causing said key to initially engage said key receiving means at the leading edge of said key.

4,907,467

STRUCTURE OF FIRST ARM OF INDUSTRIAL ROBOT HAVING ARTICULATED HORIZONTAL ARMS

Kenichi Toyoda, Hino; Nobutoshi Torii, Hachioji; Ryo Nihei, Musashino, and Akihiro Terada, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP87/00910, § 371 Date Aug. 12, 1988, § 102(e) Date Aug. 12, 1988, PCT Pub. No. WO88/04979, PCT Pub. Date Jul. 14, 1988

PCT Filed Nov. 25, 1987, Ser. No. 246,825

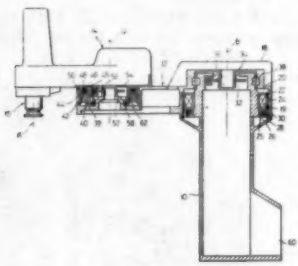
Claims priority, application Japan, Dec. 24, 1986, 61-306289

Int. Cl.[4] G05G *11/00;* **B25J** *17/00, 18/00*

U.S. Cl. 74—479 **3 Claims**

1. A structure of a first arm of an industrial robot having articulated horizontal arms, characterized in that a first direct drive motor having a yoke is disposed at one end of said first arm coaxially with a first central axis thereof for rotating said first arm, that a first drum type brake means having a drum integrated with said yoke of said first motor adjacent said brake and a first rotation position detector means coaxial with said first central axis are juxtapositioned adjacent to said first direct drive motor, that a second direct drive motor having a yoke is disposed on the other end of said first arm coaxially with a second central axis for rotating said second arm, which second arm can rotate on the base of said first arm, and that a second drum type brake means having a drum integral with

said yoke of said second motor adjacent to said second brake and a second rotation position detector means coaxial with said



second central axis are juxtapositioned adjacent to said second direct drive motor.

4,907,468

PEDAL EFFORT-REDUCTION APPARATUS

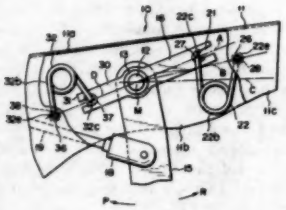
Yoshihiko Hagiwara, Sagamihara, and Katsumi Ooshima, Yokohama, both of Japan, assignors to Topre Corporation, Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,613

Claims priority, application Japan, Nov. 14, 1986, 61-174861[U]; Nov. 14, 1986, 61-174862[U]

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—512 **1 Claim**



1. A pedal effort-reduction apparatus for reducing the effort required to operate a pedal, said apparatus comprising:

(a) a support bracket including a pair of side plates;

(b) a horizontal support shaft extending between said side plates and having a center;

(c) a pedal arm rotatably supported on said support bracket by means of said support shaft;

(d) a lever movable as one with said pedal arm;

(e) a first torsion coil spring mounted between said lever and said support bracket, said first torsion coil spring having a first end which is movably supported by one side plate of said support bracket and a second end which is secured to said lever so as to apply an initial torsional moment to said first torsion coil spring, said second end of said first torsion coil spring being located on the pedal-return side of a first segment connecting the center of said horizontal support shaft and said first end of said first torsion coil spring before the pedal is operated, said first torsion coil spring being adapted to urge said pedal arm in the returning direction thereof before said second end of said first torsion coil spring reaches the first segment and to begin urging said pedal arm in the direction in which it is being pressed when said second end of said first torsion coil spring passes the first segment; and

(f) a second torsion coil spring mounted between said support bracket and said lever, said second torsion coil spring having a first end which is supported by said support bracket and a second end which is supported by said lever, said second end of said second torsion coil spring being located in the vicinity of or on the pedal-operating side of a second segment connecting the center of said horizontal support shaft and said first end of said second torsion coil spring in order to urge said pedal arm in the direction in which it is being pressed,

wherein:

(g) said first and second torsion coil springs are independent of each other and are located individually on opposite sides of said support shaft and

(h) said second end of said second torsion coil spring is located in the vicinity of the second segment before the pedal is operated.

4,907,469

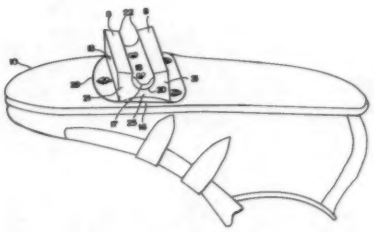
SELF GUIDING ADJUSTABLE SNAP ON PLASTIC CLEAT AND BICYCLE PEDAL

Ronald R. Gobbi, 93R Scobie Pond Rd., Derry, N.H. 03038

Continuation of Ser. No. 23,204, Mar. 9, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 273,705

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—594.6 **4 Claims**



1. A cleat (12) for securing the bottom of a shoe to a round shaft (24) of a pedal (14), the cleat comprising:

a pair of walls (21) each having an inner surface (17) with a flexible edge (22), said flexible edges opposing and spaced to receive said round shaft (24) of said pedal (14),

flexible material (23) connecting said pair of walls together, said flexible material having a concave surface (16),

means for securing said cleat to the bottom of said shoe such that said concave surface is opposed and adjacent to the bottom of the shoe,

an adjustment fixture (18) for coupling between said concave surface (16) and the bottom of said shoe to change the curvature of said concave surface thereby to change the spacing between said flexible edges to a selectable spacing to create a selectable tension to the insertion or removal of said round shaft.

4,907,470

DIFFERENTIAL HOUSING SUPPORT

James E. Kasemeier, Waterloo, Iowa, and Gary R. Fichtinger, Hazel Green, Wis., assignors to Deere & Company, Moline, Ill.

Filed Aug. 2, 1989, Ser. No. 388,462

Int. Cl.[4] F16H *57/02*

U.S. Cl. 74—606 R **4 Claims**

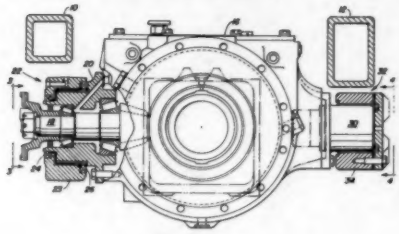
1. In combination a vehicle having a frame, a differential housing having a drive end for receiving a drive shaft and having an anti-drive, and characterized by:

a pivot pin fixed to and extending from the anti-drive end of the housing;

a support member having a hollow annular ring for pivotally receiving the pivot pin and bracket means for securing the

ring to a frame of the vehicle, the ring having an axially facing end surface;

a cover plate attached to the ring and having a central portion defining an abutment surface engageable directly with an end of the pivot pin;



means for releasably attaching the cover plate to the end face of the ring; and

at least one annular spacer member held between the cover plate and the annular end face of the ring to determine an amount of axial free play between the pivot pin and the abutment surface of the cover plate.

4,907,471

V-BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION

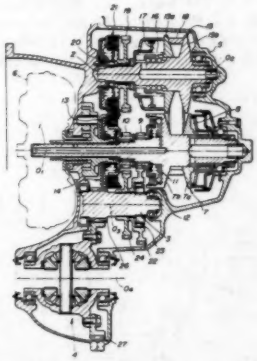
Wataru Ishimaru, Ebina City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 2, 1988, Ser. No. 278,887

Claims priority, application Japan, Dec. 4, 1987, 62-305959

Int. Cl.[4] F16H *37/00*

U.S. Cl. 74—745 **8 Claims**



1. A V-belt type continuously variable transmission, comprising:

an input shaft;

an output shaft;

a forward low power transmission gear train arranged between said input and output shafts to provide the lowest forward speed ratio, said forward low power transmission gear train including a forward low gear rotatable relative to said input shaft and means for interrupting drive connection of said forward low power transmission gear train to said output shaft;

forward low clutch means for drivingly connecting said forward low gear to said input shaft;

a V-belt power transmission train arranged between said input and output shafts to provide continuously a pulley reduction ratio ranging from the largest reduction ratio corresponding to the adjacent next low forward speed ratio higher than said lowest forward speed ratio to the smallest pulley reduction ratio corresponding to the highest forward speed ratio;

forward high clutch means for drivingly connecting said V-belt power transmission train to said output shaft;

a reverse power transmission gear train arranged between said input and output shaft in parallel to said drive connection interrupting means, said reverse power transmission gear train including a reverse gear rotatable relative to said input shaft; and

reverse clutch means for drivingly connecting said reverse gear to said input shaft.

4,907,472

POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

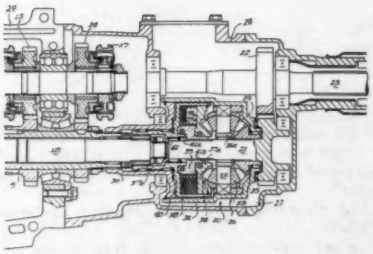
Shinichiro Mura, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,429

Claims priority, application Japan, Apr. 30, 1987, 62-107268

Int. Cl.[4] F16H *37/08, 1/44;* **B60K** *17/35*

U.S. Cl. 475—89 **10 Claims**



1. A power transmitting system for a four-wheel drive vehicle with a pair of front wheels and a pair of rear wheels, comprising a transmission housed in a transmission case for operatively transmitting power of an engine to said pair of front and rear wheels, respectively, central differential means for permitting a difference in speed between said front and rear wheels, and viscous coupling means for restricting the difference in speed between said front and rear wheels at a skidding condition of the front or rear wheels, the system comprising,

output means mounted on the transmission comprising an outer cylindrical shaft for supplying output torque of the transmission to the central differential means and comprising an inner shaft rotatably mounted in said outer cylindrical shaft for supplying output torque of the viscous coupling means to one of the front and rear wheels,

said central differential means including a differential casing connected to said outer cylindrical shaft, a first differential gear on a central differential output drive shaft for supplying an output torque thereof to the other of said front and rear wheels, a second differential gear, at least a pair of pinion shafts secured to said differential casing, and pinion gears rotatably mounted on said pair of pinion shafts, respectively, and meshing with both of said differential gears, respectively,

an extension case, forming a central differential chamber, provided at one end of the transmission case for containing said central differential means in said central differential chamber,

said differential casing extending so as to contain said viscous coupling means,

said viscous coupling means being disposed in said differential casing and comprising a housing secured with said

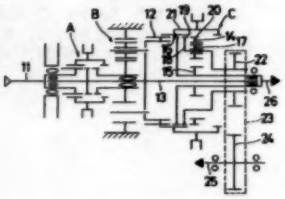
inner shaft at one end and secured to said second differential gear at another end thereof, and a hub secured to the central differential output drive shaft, said hub and said housing having cooperating viscous coupling disks, and said housing being rotatably mounted on the output drive shaft through a bearing.

4,907,473

DIFFERENTIAL MECHANISM OF A FOUR-WHEEL DRIVING APPARATUS FOR VEHICLES

Yuuki Fujitani, Toyota, and Kouji Kawakami, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1988, Ser. No. 251,763
Claims priority, application Japan, Sep. 30, 1987, 62-246279
Int. Cl.[4] F16H *1/44, 37/06*; B60K *17/352*
U.S. Cl. 475—250 **3 Claims**



1. A differential mechanism of a four-wheel driving apparatus for vehicles having a planetary gear and transmitting driving torque from an input shaft to a front wheel driving shaft and a rear wheel driving shaft in a distributing manner, comprising:

a first spline rotated by the driving torque from said input shaft,

a second spline connected so as to be integrally rotatable with a sun gear of said differential planetary gear,

a third spline connected so as to be integrally rotatable with a carrier,

a fourth spline provided on an outer circumferential surface of a ring gear, and

a differential change sleeve mounted in a radially outward direction from each of said first, second, third and fourth splines for axially sliding movement between two positions, said first and fourth splines positively connected with each other at a first position of said change sleeve and said first, second and third splines positively connected with each other at a second position of said change sleeve.

4,907,474

MECHANICAL TORQUE CONVERTER

John G. Bolger, Orinda, Calif., assignor to Inductran Corporation, Berkeley, Calif.

Filed Oct. 7, 1988, Ser. No. 255,011
Int. Cl.[4] F16H *3/74*
U.S. Cl. 475—14 **24 Claims**

1. A mechanical torque converting transmission adapted for use with a rotary power source, said transmission comprising:

a rotary input shaft adapted for attachment to the rotary power source for supplying input torque at a preselected speed;

a main gear means connected to said rotary input shaft;

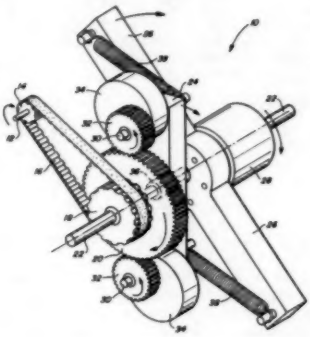
an output shaft;

a rotatable arm assembly;

pinion gear means meshed with said main gear means and journaled for rotation on said arm assembly about an axis spaced from and parallel to the rotational axis of said main gear means;

eccentric means driven by said pinion gear means for creating a centrifugal force that cyclically urges said arm assembly in alternating forward and backward directions with a pulsating motion during each rotation of said eccentric means;

clutch means for allowing forward movement of said arm assembly while preventing said arm assembly from moving in the backward direction during each said cycle; and



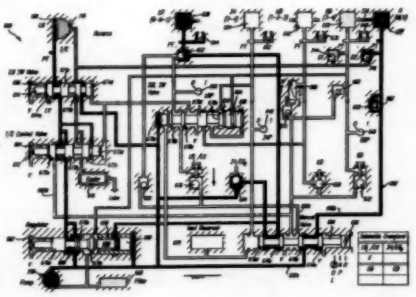
resiliently displaceable means interconnecting said arm assembly and said output shaft for transforming the pulsating motion of said arm assembly to a smooth rotational motion of said output shaft; whereby said output shaft may be caused to rotate at a lower speed but at a higher torque than said input shaft.

4,907,475

FLUID SWITCHING MANUALLY BETWEEN VALVES IN AN AUTOMATIC TRANSMISSION

Gerald L. Holbrook, Rochester Hills, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 187,181
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—867 **5 Claims**



1. A valve assembly in a fluid system of a vehicle transmission for directing fluid flow from a fluid source to at least one fluid actuated device in the transmission, said assembly comprising:

a first solenoid-actuated valve means for directing fluid flow to a fluid actuated device;

a second solenoid-actuated valve means for directing fluid flow to the fluid actuated device;

manual valve means being moveable for directing fluid flow between either of said first and second solenoid-actuated valve means; and

a manually actuated shaft means being connected to said

manual valve means and being manually operated for positioning said manual valve means in a first position for directing fluid flow to said first solenoid-actuated valve means and in a second position for directing fluid flow to said second solenoid-actuated valve means to actuate the fluid actuated device.

4,907,476

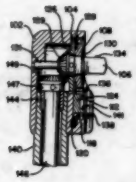
SOCKET WRENCH WITH IMPROVED HANDLE

Robert P. Singleton, Birmingham, Ala., assignor to Sidewinder Products Corporation, Birmingham, Ala.

Continuation-in-part of Ser. No. 771,625, Sep. 3, 1985, which is a continuation-in-part of Ser. No. 746,673, Jun. 20, 1985, Pat. No. 4,620,459. This application Jul. 17, 1987, Ser. No. 74,572

Int. Cl.[4] B25B *17/00, 13/46*

U.S. Cl. 81—57.29 **7 Claims**



1. A socket wrench with reversing ratchet comprising: an elongated casing; a gear shaft mounted coaxially within said casing; a bevel gear mounted on one end of said gear shaft; a handle member mounted on the other end of said gear shaft, said gear shaft being formed as an integral unit with said bevel gear so that rotation of said handle member results in direct rotation of said bevel gear, said gear shaft being in the form of a single straight continuous shaft from the bevel gear on said one end of the gear shaft to the handle on said other end of the gear shaft; a pinion shaft mounted in said casing, said pinion shaft being located adjacent said bevel gear and extending perpendicular to said gear shaft; a bevel pinion gear with hub member mounted on one end of said pinion shaft, said bevel pinion gear being in engagement with said bevel gear; a drive shaft secured to said pinion shaft so as to be coaxial therewith and extending outwardly from said casing; a bearing plate with an interior portion of reduced diameter, said bearing plate being mounted on said bevel pinion hub member; a ratchet wheel having a plurality of teeth around the circumference thereof, said ratchet wheel being mounted on said drive shaft and rotatable therewith; means for releasably engaging said ratchet wheel to prevent rotation of said drive shaft; and closure means mounted on the drive shaft for maintaining said bearing plate and said ratchet wheel in position, said closure means including a first snap ring mounted about said drive shaft between said bearing plate and said ratchet wheel, said first snap ring being retained within a groove in said casing, and wherein a second snap ring is mounted on said drive shaft on the side of said ratchet wheel opposite the side where said first snap ring is mounted, said second snap ring being retained within a groove in said drive shaft.

4,907,477

APPARATUS FOR REMOVING BASE OF BROKEN LAMP FROM A SOCKET

Melvin A. Farber, 8901 Turton Dr., Philadelphia, Pa. 19115

Filed Aug. 1, 1988, Ser. No. 227,064

Int. Cl.[4] B25B *7/02*

U.S. Cl. 81—302 **5 Claims**

1. In a lamp having a bulb and a lamp base that is insertable into a socket, an apparatus for removing the lamp base from the socket after its bulb has been broken, comprising:

(a) a plurality of jaws adapted to engage the inside surface of the lamp base;

(b) means including handles coupled to the jaws for moving the jaws relative to each other; and,

(c) spring means operatively coupled to the handles for urging the handles together and the jaws apart;

whereby the jaws are insertable into the lamp base after application of an expansive force to the moving means to move the jaws together, the spring means urges the jaws apart to engage the inner surface of the lamp base when the expansive force is removed, and thereafter the lamp base is removable from the socket by application of a rotative force to the handles.

4,907,478

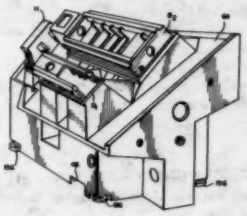
APPARATUS AND PROCESS FOR ASSEMBLING A MACHINE TOOL AND MACHINE TOOL FORMED THEREBY

Ivan R. Brown, deceased, late of Breesport (by Claudia D. Brown, executrix); Brian M. Eaton, Pine City, and Robert B. Carlyle, Horseheads, all of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Nov. 10, 1987, Ser. No. 118,928

Int. Cl.[4] B23Q *1/00*

U.S. Cl. 82—149 **30 Claims**



1. A machine tool assembly, comprising:

(a) a cementitious base having a plurality of spaced grooves formed therein, each groove has an opening disposed on a plane common to said grooves;

(b) bedway means have a lower planar surface from which a plurality of tongues extend;

(c) said bedway means disposed relative to said base so that each of said tongues is disposed in one of said grooves;

(d) resilient means disposed between and engaged with said base and said bedway means for spacing said lower planar surface from said common plane and for absorbing forces tending to cause said bedway means to move relative to said common plane; and,

(e) grout means substantially filling each of said grooves throughout the length thereof for securing said tongues in said grooves and thereby said bedway means to said base.

4,907,479

APPARATUS FOR CUTTING LAMINATED SHEET MATERIAL

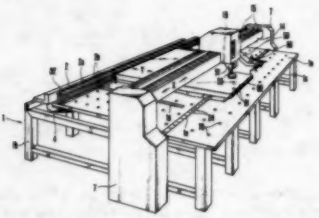
Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Kiroshima, Japan

Filed Apr. 5, 1988, Ser. No. 177,968

Claims priority, application Japan, Apr. 23, 1987, 62-100955

Int. Cl.[4] B26D *7/00, 7/20;* **D06H** *7/00*

U.S. Cl. 83—422 **6 Claims**



1. An apparatus for cutting a laminate of sheet material at least upper and lower surfaces of which are covered with an air-impermeable sheet, comprising:

a pedestal having a supporting surface on which the laminate is supported;

a suction pipe arranged on said supporting surface and having a side face provided with a suction port for attracting a side face of the laminate;

suction pipe driving means coupled to said suction pipe for reciprocating said suction pipe in one direction;

a cutter head supported above the laminate and having a cutter attached thereto;

cutter head driving means coupled to said cutter head for reciprocating said cutter head in a direction orthogonal to the direction in which said suction pipe is reciprocated;

said supporting surface having a guide groove opposing a path along which said cutter head is reciprocated;

a number of interconnected closure plates fitted into said guide groove and driven in synchronization with said cutter head;

a cutter receiving sleeve for receiving a tip of said cutter movably inserted therein; and

a mounting member for connecting said cutter receiving sleeve between closure plates;

upper surfaces of said closure plates, said cutter receiving sleeve and said mounting member being made flush with said supporting surface.

4,907,480

TURRET PUNCH PRESS MACHINE

Kazuo Kuroyone, Yamato, Japan, assignor to Anritsu Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 138,712

Claims priority, application Japan, Dec. 26, 1986, 61-308560; Dec. 27, 1986, 61-309211; Dec. 27, 1986, 61-309212; Dec. 27, 1986, 61-309213

Int. Cl.[4] B21D *28/26, 28/36*

U.S. Cl. 83—552 **11 Claims**

1. A turret punch press machine comprising:

a frame including:

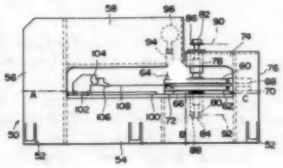
a base frame portion;

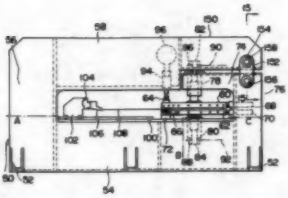
column portions provided on said base frame portion, said column portions having upper ends; and

an upper frame portion substantially horizontally extending from the upper ends of said column portions;

said upper frame portion comprising at least a first upper frame portion and a second upper frame portion, said first and second upper frame portions being separate and structurally independent of each other so that one of said first and second upper frame portions is not deformed upon deformation of the other of said first and second upper frame portions;

a pair of upper and lower turrets each having plural die halves at circumferential rim portions thereof, said upper turret being mounted to said second upper frame portion,





and said lower turret being mounted to said base frame portion;

hammer means mounted to said first upper frame portion for striking the die halves downward; and

a hammer driving mechanism mounted to said first upper frame portion for driving said hammer means.

4,907,481

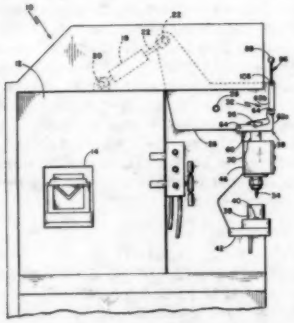
POWERED PRESS WITH MANUAL PUNCH AND DIE ALIGNMENT CAPABILITY

Jim Dvorak, P.O. Box 155, and Charles J. Dvorak, P.O. Box 67, both of Cosmos, Minn. 56338

Filed Sep. 2, 1987, Ser. No. 92,038

Int. Cl.[4] B26F *1/02*

U.S. Cl. 83—571 **7 Claims**



1. A punch apparatus comprising a ram, means guiding siad ram for reciprocal movement, drive means for powering said ram, a latch mechanism on said drive means for connecting said ram to said drive means in one position thereof so that said ram moves in unison with said drive means to perform a powered punching operation and for disconnecting said ram from

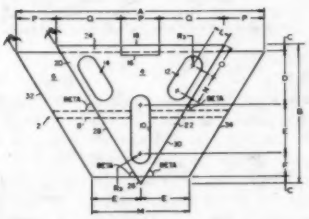
said drive means in a second position thereof, sand a handle unit, said latch mechanism including means mounting said handle unit on said latch mechanism for pivotal movement between first and second positions to cause said latch mechanism to move between its said first and second positions when said handle unit is pivoted from its said first position into tis said second position so that said ram can be manually moved by said handle unit relative to said drive means to enable an operator to manually align a die with a punch on said ram and to do so prior to a powered punching operation.

4,907,482

GUIDE FOR HAND HELD POWER SAWS

Lawrence W. Hujo, 3407 Mardale Dr., Jeffersontown, Ky. 40299

Filed Feb. 26, 1988, Ser. No. 160,596
Int. Cl.[4] B27B *9/04*
U.S. Cl. 83—745 **3 Claims**



1. A guide for cutting compound miters in crown moulding with a circular saw, comprising:

a substantially flat base plate defining a side edge;

a guide rail mounted on top of the base plate and defining a guide edge lying inside the side edge of the base plate, so a circular saw can rest on the base plate and be guided by the guide edge;

a fence mounted on the underside of said base plate at an angle of approximately 59° to the guide edge of the guide rail; and

a bevel adjusting member mounted on the guide, said bevel adjusting member having one side at an angle of approximately 33.85° from the vertical, wherein the bevel adjusting member can be used to set the angle of the blade on a circular saw.

4,907,483

MUSICAL INSTRUMENT SUSTAINERS AND TRANSDUCERS

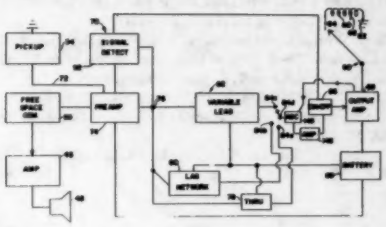
Floyd D. Rose, 5610 145th Ave. SE., Bellevue, Wash. 98006; Steven M. Moore, 14264 SE. 6th St. T-205, Bellevue, Wash. 98007, and Richard W. Knotts, 201 Galer #241, Seattle, Wash. 98109

Filed May 27, 1988, Ser. No. 199,851
Int. Cl.[4] G10H *3/18, 3/26*
U.S. Cl. 84—726 **36 Claims**

1. A sustainer for a musical instrument having a vibratory element comprising:

(a) drive means responsive to a drive signal for applying a drive force to a vibratory element of said instrument so that said drive force has a predetermined phase relationship to said drive signal; and

(b) feedback means for accepting a pickup signal representing vibration of a vibratory element of said instrument and having a predetermined phase relationship to said vibration and providing said drive signal to said drive means so



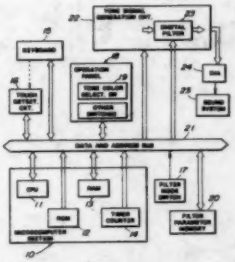
that said drive force is substantially in phase with vibration of said vibratory element.

4,907,484

TONE SIGNAL PROCESSING DEVICE USING A DIGITAL FILTER

Hideo Suzuki; Yoshio Fujita, and Hirotaka Kuribayashi, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 30, 1987, Ser. No. 115,772
Claims priority, application Japan, Nov. 2, 1986, 61-261192; May 22, 1987, 62-125560; May 22, 1987, 62-125561
Int. Cl.[4] G10H *1/12, 7/00*
U.S. Cl. 84—661 **28 Claims**



25. A tone signal processing device comprising:

coefficient supply means for storing plural sets of coefficients corresponding to different filter characteristics;

reference value data designating means for designating reference value data which determine a manner in which at least two sets of said plural sets of coefficients are to be mixed;

filter coefficient generating means for receiving said at least tow sets and for generating a filter coefficient based on said at least two sets in accordance with said manner; and

digital filter means receiving a tone signal for modifying the tone signal in accordance with said filter coefficient, so that a characteristic determined by said filter coefficient is imparted to said tone signal.

4,907,485

METHOD FOR THE ATTACKING OF A TARGET OBJECT FROM AN OVERFLYING PROJECTILE AND OVERFLYING PROJECTILE FOR IMPLEMENTING THE METHOD

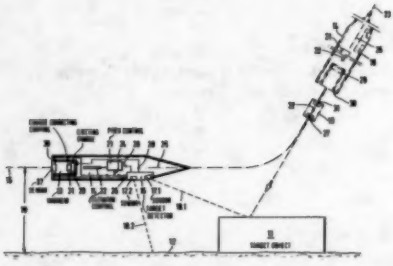
Robert Westphal, Nuremberg, and Wolfgang Babel, Rothenbach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 1, 1989, Ser. No. 359,529

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821218

Int. Cl.[4] F41G 9/00; F42B 13/10

U.S. Cl. 89—1.11 6 Claims



1. A method for the attacking of a target object from an overflying projectile, said projectile having a warhead; and a target detector for the launching of said warhead, comprising guiding said projectile for scanning of a target area at a low altitude of flight; and upon detecting of a target object detection pulling said projectile into a steeply ascending trajectory having the trailing end thereof directed towards the target object so as to initiate said warhead opposite the direction of the ascending trajectory from the tail end of the projectile in a direction towards the target object.

4,907,486

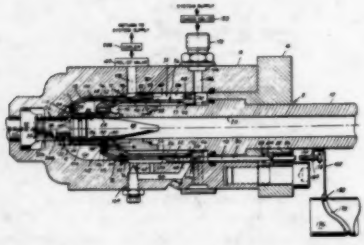
LIQUID PROPELLANT GUN

Robert E. Mayer, Williamstown, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 6, 1977, Ser. No. 840,104

Int. Cl.[4] F41F 1/04

U.S. Cl. 89—7 10 Claims



1. In a regenerative liquid propellant gun having a combustion space which includes that portion of the bore of the gun barrel behind the projectile before and during projectile acceleration during firing and wherein liquid propellant is injected through conduit means into the combustion space by means of force exerted on a body of liquid propellant in a dispensing reservoir by movement of a mechanical element responsive to the gaseous pressure in the combustion space during firing, the improvement wherein said conduit means comprises a passageway extending from said reservoir through the gun barrel to an opening into said bore at a location within the extent of that portion of the projectile to be fired which is in contact with the bore surface when said projectile is in its ready for firing position whereby the projectile acts as a valve to initially block flow of liquid propellant from said passageway into said bore and to subsequently permit such flow when the projectile moves down the barrel beyond said opening.

4,907,487

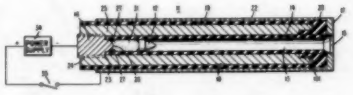
APPARATUS FOR AND METHOD OF ACCELERATING A PROJECTILE THROUGH A CAPILLARY PASSAGE AND PROJECTILE THEREFOR

Derek A. Tidman, Silver Spring, Md.; Yong C. Thio, Alexandria, Va., and Yeshayahu Shyke A. Goldstein, Gaithersburg, Md., assignors to GT-Devices, Alexandria, Va.

Filed Nov. 12, 1986, Ser. No. 929,365

Int. Cl.[4] F41F 1/02

U.S. Cl. 89—8 33 Claims



1. Apparatus for accelerating a projectile comprising a structure having a capillary passage with a dielectric wall containing ionizable material, first and second electrodes at spaced points along the length of the passage, the projectile being positioned in the passage, one end of the passage being closed and the other end being open so that the projectile can be projected through it, means for establishing a discharge along the length of the passage between the electrodes and through the projectile for ionizing the material from the wall in front and in back of the projectile to form a high pressure region behind the projectile to accelerate the projectile along the passage and through the open end of the passage.

4,907,488

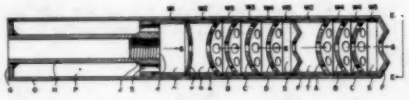
DEVICE FOR SILENCING FIREARMS AND CANNON

Oswald P. Seberger, P.O. Box 377, Shingletown, Calif. 96088

Filed Mar. 29, 1988, Ser. No. 175,039

Int. Cl.[4] F41F 17/12

U.S. Cl. 89—14.4 4 Claims



1. A silencer to be fitted on the muzzle of a firearm for firing a projectile having a barrel of known caliber and outside diameter, said barrel having a longitudinal axis comprising:

(a) a cylindrical silencer tube having a longitudinal axis;

(b) means for attaching said cylindrical silencer tube to said muzzle of said firearm, such that said longitudinal axis of said cylindrical silencer tube is coaxially aligned with the longitudinal axis of said barrel;

said attaching means for said cylindrical silencer tube having positioned in its interior a cylindrical mounting element disposed for threading upon the muzzle of said barrel, said cylindrical mounting element containing a central, threaded hole and a plurality of additional holes parallel to said longitudinal axis of said cylindrical silencer tube, said plurality of additional holes being substantially circularly disposed around said central hole of said cylindrical mounting element, said attaching means for said cylindri-

cal silencer further having a tubular member, and said cylindrical mounting element having a shoulder for fastening thereto of said tubular member

(1) said tubular member having an outside diameter and having an inside diameter large enough to pass over said barrel, said tubular member being secured at one end thereof to the shoulder of said mounting element, said tubular member having a flat annular disc member pressed opposite said cylindrical mounting element

(2) said flat annular disc member having an inside diameter equal to said outside diameter of said tubular member and having an outside diameter equal to the inside diameter of said cylindrical silencer tube, said flat annular disc member being welded to said tubular member and to one end of said cylindrical silencer tube whereby the other end of said cylindrical silencer tube is supported in space by said cylindrical mounting element; and

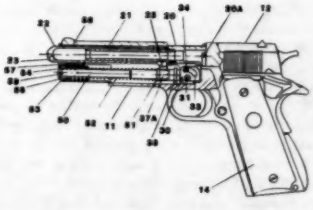
(d) a quasi-parabolic disc positioned within the interior of said cylindrical silencer tube, said quasi-parabolic disc having a centrally located hole for the passage of said missile and gas, and having a focus point at the end of said muzzle and an annular dispersion area at the center of said additional holes circularly disposed around the threaded hole of said cylindrical mounting element, whereby said quasi-prabolic disc directs said gas and sound waves from said muzzle back through said additional holes circularly disposed in said cylindrical mounting element.

4,907,489

BLANK FIRE CONFIGURATION FOR AUTOMATIC PISTOL

Tommy L. Teague, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1988, Ser. No. 238,450
Int. Cl.[4] F41C *21/22*; F41F *17/12*
U.S. Cl. 89—14.5 **6 Claims**



1. An automatic pistol operable to fire blank ammunition wherein said pistol includes a frame, a slide mounted on said frame for reciprocal movement between a first position and a second position, wherein when said slide is in the first position, said pistol can fire, moving said slide to the second position, allowing a spent cartridge to be ejected as said slide moves toward the second position and a live cartridge to be positioned for firing as said slide moves back toward the first position, said pistol comprising:

(a) a modified barrel including a breech and an inner hollow sleeve rigidly attached to and extending from said breech;

(b) an outer sleeve having a diameter greater than said inner sleeve and having a constricted orifice therein, said outer sleeve telescopically receiving said inner sleeve;

(c) barrel anchor means connected to said frame of said pistol, said barrel anchor means including means for connecting said breech of said modified barrel to said barrel anchor means and means for restraining motion of said breech to arcuate motion with respect to said barrel anchor means and means for restraining forward motion of said outer sleeve with respect to said barrel anchor means;

(d) rod means projecting from said barrel anchor means in a direction substantially parallel to the direction of said sleeves when said slide is in the first position;

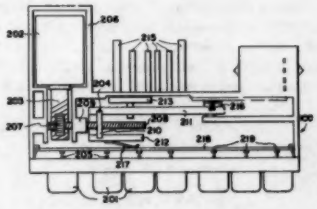
(e) a shortened recoil spring received over said rod means, said spring having an inboard end abutting a stop on said barrel anchor means and an outboard end abutted by spring retaining means connected to said slide, whereby when said pistol is fired, said slide moves toward the second position against the bias of said spring to eject the spent cartridge from said breech while said breech moves slightly backward in an arc to receive a fresh cartridge and said outer sleeve remains horizontally stationary with respect to said frame, said spring restoring said slide, said breech, and said inner sleeve to their original positions upon pushing said slide to its first position.

4,907,490

VEHICLE CLIMATE CONTROL APPARATUS

David W. Taylor, Goodrich, and Benjamin H. Baker, Davison, both of Mich., assignors to Cirtek Corporation, Flint, Mich.

Filed Oct. 13, 1988, Ser. No. 256,966
Int. Cl.[4] F15B *21/02*
U.S. Cl. 91—36 **17 Claims**



1. In a pneumatic vehicle climate control system having a plurality of spaced apart pneumatic ports one of which leads to a pneumatic source and each of the others of which leads to a specific pneumatically operable device, a movable carrier, and valve means carried by said carrier and operable in response to movement thereof to couple and uncouple selected ports to and from one another, the improvement comprising an electrical driving motor; drive transmitting means coupling said motor and said carrier for moving the latter in response to energization of said motor; motor control circuit means for energizing and deenergizing said driving motor; input means coupling said circuit means to an energy source for energizing said motor; and feedback means coupled to said energy source and said control circuit means and being operable to deenergize said motor in response to movement of said carrier and said valve means to a selected position with respect to said ports, said feedback means including a conductive member carried by said carrier for sliding engagement with a resistor ladder.

4,907,491

EXTENDED-TRAVEL ACTUATOR WITH CLAMPS ON ROD AND CYLINDER END FOR CLAMPING CENTRAL ROD

Stanislaw F. Filip, 1245 Martingrove Road, Rexdale, Ontario, Canada

Filed Aug. 12, 1988, Ser. No. 231,694
Claims priority, application Canada, Aug. 14, 1987, 544622
Int. Cl.[4] F15B *15/26*; F01B *15/02*
U.S. Cl. 91—44 **2 Claims**

1. An expansion chamber having extended travel comprising:

a rod of a given length;

a cylinder of shorter length of said rod surrounding a portion of said rod and movable along the length of said rod;

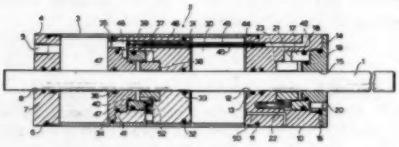
said cylinder comprising a cylindrical wall axially parallel to said rod;

a back wall forming one end of said cylinder sealed against said rod;

a front end piece forming the other end of said cylinder and sealed against said rod;

a piston assembly mounted on said rod within said cylindrical wall between said back wall and said front end piece and sealed against said cylinder wall and against said rod;

a front end piece clamp to releasably clamp said front end piece to said rod;



a piston assembly clamp to releasably clamp said piston assembly to said rod;

means to apply fluid pressure selectively to the interior of said cylinder between said piston assembly and said back wall and between said piston assembly and said front end piece so as to move said piston assembly between a forward position and a rearward position in said cylinder; and

said front end piece clamp and said piston assembly clamp being activated by fluid pressure.

4,907,492

APERTURED VALVE DISPOSED IN HOLLOW PISTON ROD OF FOLLOWER-TYPE MOTOR

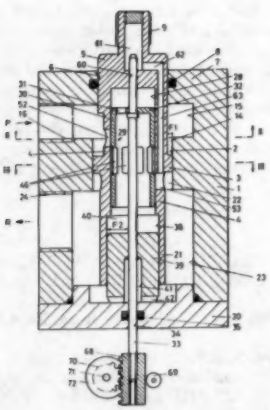
Karl Hampejs, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 27, 1988, Ser. No. 203,258

Claims priority, application Switzerland, Jun. 16, 1987, 2265/87

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—49 **9 Claims**



1. A hydraulic linear servo-amplifier comprising:

a housing with a first cylindrical bore, a second cylindrical bore extending through a first end wall of the housing, and a third cylindrical bore extending through a second end wall of the housing, the second bore and the third bore being coaxial with and smaller than the first bore;

a first cylinder chamber formed in said housing;

a fluid supply connection in said housing communicating with said first cylinder chamber formed in said housing for supplying hydraulic fluid under pressure to said first chamber;

a second cylinder chamber formed in said housing;

a return connection formed in said housing communicating with a return chamber in said housing for returning fluid from said return chamber;

a piston slidably received in said first bore;

a piston rod connected to said piston and extending through said second bore, said piston rod having a coaxial cylindrical bore formed therein that is axially open toward said second end wall of said housing;

a slide valve member slidably received in said cylindrical bore of said piston rod and having a tubular, cylindrical wall, an end wall facing said first end wall of said housing and being axially open toward said second end wall of said housing, and a plurality of apertures formed through said cylindrical wall, with at least one respective edge of said apertures forming a first control edge;

a control rod extending through said third cylindrical bore in said housing and being fastened to said end wall of said valve member;

a passage formed in said piston rod and together with said cylindrical bore in said piston rod forming at least one second control edge cooperating with said first control edge for controlling flow of fluid through said apertures in said slide valve member and through said open axial end of said valve member into and out of said second cylinder chamber, respectively; and

wherein said plurality of apertures formed in said cylindrical wall of said valve member are rectangular in cross-section, wherein first outer edges of said apertures laying in a first common radial plane form said first control edge and opposite outer edges of said apertures laying in a second, axially spaced-apart, common radial plane form a third control edge, wherein a first passage including a plurality of first radial slots formed in said piston rod communicates with said first cylinder chamber and together with said coaxial cylindrical bore in said piston rod forms said second control edge, and wherein a second passage including a plurality of second radial slots formed in said piston rod communicate with said return chamber and together with said coaxial cylindrical bore in said piston rod form a fourth control edge, wherein said first and second control edges cooperate for controlling fluid flow into the second cylinder chamber and said third and fourth control edges cooperate for controlling fluid flow out of the second cylinder chamber.

4,907,493

VALVE CONTROL SYSTEM FOR HITCH MOTOR

Regis Bellanger, Beauvias, France, and William J. Graaskamp, Guelph, Canada, assignors to Massey-Ferguson Services N. V., Curacao, Netherlands

Filed Mar. 30, 1987, Ser. No. 31,819

Claims priority, application United Kingdom, Apr. 3, 1987, 8608194

Int. Cl.[4] F15B *13/16*

U.S. Cl. 91—361 **9 Claims**

1. A system for the control of a fluid flow control valve which controls the supply of fluid to an actuator to control the movement of a component in response to a selected parameter, the system comprising:

means for setting a desired value of the selected parameter,

means for sensing the actual value of the selected parameter,

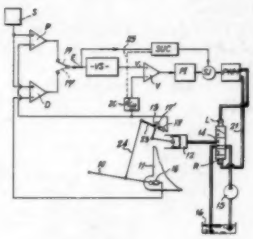
first comparator means for comparing the desired and actual values of the selected parameter to provide a parameter error signal,

control means for supplying a control signal to the valve

dependent on the error signal to move the component so as to tend to reduce the error signal to zero,

means for providing a signal indicating that the component has begun to move in response to the imposition of a given valve control signal, and

a start-up control function which on detection of a parameter error signal applies a start-up signal to the valve to initiate movement of the component and, if no movement results, increases the start-up signal until movement of the component is detected whereupon the increase in the start-up signal is stopped and the magnitude of the signal applied to the valve is dependent on the error signal so as to tend to reduce the error signal to zero.



4,907,494

BRAKE BOOSTER WITH RETAINING KEY AND RING

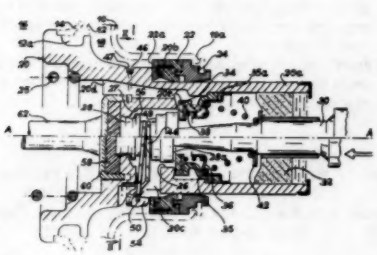
Jean-Pierre Gautier, Aulnay Sous Bois; Miguel Perez, Argenteuil, and Pedro Verbo, Aulnay Sous Bois, all of France, assignors to Bendix France, Drancy, France

Filed Aug. 11, 1988, Ser. No. 231,410

Claims priority, application France, Sep. 17, 1987, 87 12868

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369.3 **6 Claims**



1. Brake booster comprising an external casing, a hollow piston, which is axially mobile in the casing; first resilient means (25) which tends to displace the piston into a rear rest position in which a bearing surface of the piston is in contact with a stop surface of the external casing; a control rod arranged along the axis of the piston and carrying a plunger at a front end; second resilient means which tends to displace the control rod into a rear rest position; a valve flap mounted in sealed manner inside the hollow piston, around the control rod; third resilient means which tends to displace the valve flap forwards to bring it into contact with a first valve seat formed on the plunger, when the control rod occupies the rear rest position, and with a second valve seat formed on the piston, when the control rod is displaced forwards; a stationary stop member mounted in the hollow piston, and on which the plunger bears when the control rod is displaced forwards; a tilting stop member of which one end is suitable to pivot with respect to the stationary stop member and of which the opposite end has a stop, the rear rest position of the control rod being determined by the plunger coming to bear on the tilting stop member, and the stop bearing against the stop surface of the casing; and a retaining ring for holding the stationary and tilting stop members, this retaining ring being received in an annular groove formed in the piston and having at least one holding part bearing against one edge of the stationary stop member turned towards the outside of the piston; characterized in that the retaining ring also has a rectilinear part oriented in parallel with the axis of the piston and received in a groove formed in the stop, so as to enable the tilting stop member to pivot, while keeping the latter in the piston.

4,907,495

PNEUMATIC CYLINDER WITH INTEGRAL CONCENTRIC HYDRAULIC CYLINDER-TYPE AXIALLY COMPACT BRAKE

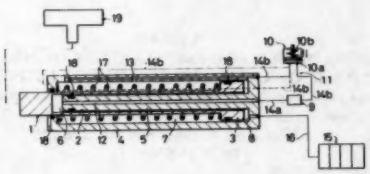
Sumio Sugahara, 1781-3, Furuichiba, Saiwai-ku, Kawasaki-shi, Japan

Continuation of Ser. No. 41,971, Apr. 24, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,296

Claims priority, application Japan, Apr. 30, 1986, 61-100600

Int. Cl.[4] F15B *15/22, 15/26*

U.S. Cl. 92—9 **8 Claims**



1. A composite hydraulic cylinder apparatus comprising a pneumatic cylinder mechanism and a braking oil hydraulic cylinder mechanism associated concentrically with the pneumatic cylinder mechanism, wherein sections of a front chamber and a rear chamber of the braking oil hydraulic cylinder mechanism overlap concentrically so as to equalize the volume changes of the chambers, said chambers being communicated through an oil passage with a control valve provided therein to control the flow of the oil.

4,907,496

SPRING FORCE ACTUATORS

Brian P. Neal, Bristol, United Kingdom, assignor to Bendix Limited, Bristol, England

Filed Oct. 27, 1988, Ser. No. 263,297

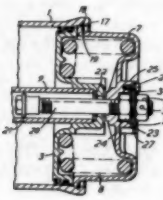
Claims priority, application United Kingdom, Oct. 31, 1987, 8725562

Int. Cl.[4] F15B *15/26*

U.S. Cl. 92—17 **4 Claims**

1. A spring force actuator comprising a housing, an output member movable axially in said housing, said housing having an end wall, a spring captive between said member and said end wall, said spring being operable to apply an output force to said output member, a threaded wind-off element coaxial with the housing and extending through said end wall for engagement with the output member to apply an opposing force to the spring to relieve the output member of said output force, a nut having a polygonal cross section threadedly engaging said wind-off element, means carried on said end wall defining a recess through which the wind-off element extends, said recess defining an opening accessible from the exterior of the housing, said nut being received in said recess through said opening, said recess having a polygonal cross section compatible with the cross section of said nut to prevent rotation of the nut

relative to the housing when the nut is received within the recess, and retaining means cooperating with the nut and the



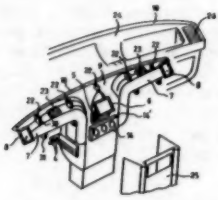
recess to prevent axial movement of the nut relative to the housing.

4,907,497

RIGID DEVICE FOR INSTALLATION OF HEATING AND/OR AIR CONDITIONING IN AN AUTOMOBILE

Jacques Danieau, Noisy-le-Roi, France, assignor to Valeo, Paris, France

Filed Aug. 4, 1988, Ser. No. 228,126
Int. Cl.[4] B60H *1/26*
U.S. Cl. 98—2.08 **4 Claims**



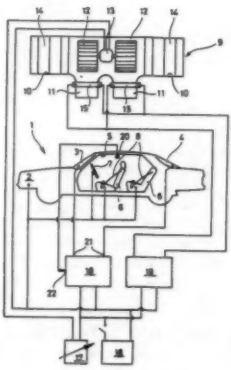
1. For use in the assembly of a passenger vehicle having the normal components thereof including a passenger space, windshield and dashboard; an air control unit for installation of an air control system as a self-contained structure in the vehicle independent of the dashboard and in communication with the passenger space and windshield of the vehicle, said unit comprising a one-piece housing, air treatment components within said housing, a first series of outlets formed in and opening outward of said housing including a rigid central duct having a central outlet and laterally directed rigid ducts in communication with said central duct having outlets to each side of said central duct for air discharge into the passenger space, a second series of outlets formed in and opening outward of said housing and extending along said laterally directed ducts generally between said outlets to each side of said central duct and remote from said first series of outlets, said central and laterally directed ducts being integrally defined by said one-piece housing, said ducts communicating said air treatment components with each of said outlets, said housing, with the formed outlets and integrally defined ducts, being a rigid unit and mountable as a unit on the vehicle with the first series of outlets directed inward toward the passenger space and the second series of outlets directed toward the windshield.

4,907,498

DEVICE FOR ELECTROCLIMATIZATION OF THE INNER CHAMBER OF A MOTOR VEHICLE

Paul J. M. Haufe, Sudring 10, 8878 Bibertal-Anhofen, Fed. Rep. of Germany

PCT No. PCT/EP88/00007, § 371 Date Aug. 8, 1988, § 102(e) Date Aug. 8, 1988, PCT Pub. No. WO88/04998, PCT Pub. Date Jul. 14, 1988
PCT Filed Jan. 6, 1988, Ser. No. 252,367
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700362
Int. Cl.[4] B60H *3/00*
U.S. Cl. 98—2.11 **18 Claims**



1. An assembly for electroclimatising the interior space of a motor vehicle comprising:

a vehicle chassis including at least two windows in substantially opposed relation to each other;

means connected to said opposing windows for creating an electric field extending between said windows; and

means for introducing ions into said interior space of said motor vehicle,

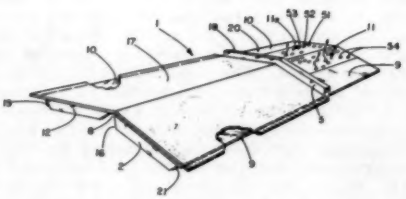
whereby said electric field causes said ions to travel substantially beyond said ion introducing means within said interior space of said motor vehicle.

4,907,499

ROOF RIDGE VENTILATORS AND METHODS FOR INSTALLING SUCH VENTILATORS

Gstacre A. F. James, 1104 El Prado, San Clemente, Calif. 92672

Filed Apr. 12, 1989, Ser. No. 337,055
Int. Cl.[4] F24F *7/02*
U.S. Cl. 98—42.21 **20 Claims**



1. A roof ridge ventilator comprising two panels joined by bendable hinge means, each of said panels having an upper surface and a lower surface, each of said lower surfaces including a plurality of spaced-apart, downwardly-projecting support means joined to said lower surfaces at substantially right

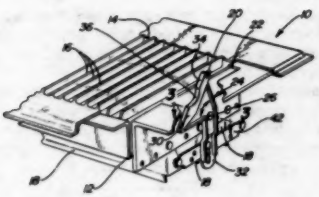
angles, and extending transversely across the widths of said lower surfaces, said support means on each panel having differing heights, with the first support means of greatest height being near one end of said bottom surfaces, and with each successive support means behind said first support means having successively smaller height than the preceding support means; each of said lower surfaces having substantially the same number of support rib means with substantially the same sizes and spacing to permit bending of said ventilator over, and placement of said ventilator on a roof ridge; each of said panel means including, near the end opposite said one end, air passage means having a size and shape sufficiently small to permit overlapping said air passage means with a portion of the bottom surface of another of said ventilators.

4,907,500

ONE-PIECE LEVER FOR MULTI-LOUVERED DAMPER

Douglas S. Brown, Knoxville, Tenn., assignor to American Metal Products Company, Los Angeles, Calif.

Filed Feb. 23, 1989, Ser. No. 314,732
Int. Cl.[4] F24F *13/15*
U.S. Cl. 98—110 11 Claims



1. An operating lever for a multi-louvered damper, said damper including a frame, an outer face and a plurality of rotatable louvers simultaneously movable between first and second positions to control the air flow through the damper, said operating lever comprising:

an integral body having an engagement portion and an extension arm, said engagement portion having a substantially triangular configuration with an engagement edge forming one side of said triangle and said arm extending from an apex of said triangle opposite from said engagement edge, said body pivotably mounted to the damper frame for movement between a first lever position wherein the plurality of louvers are in their first position and said engagement edge is substantially flush with the damper face so as not to protrude beyond the damper face and a second lever position wherein the plurality of louvers are in their second position and said engagement edge is disposed at an angle to the damper face thereby providing a visual indication that the louvers are in their second position; and

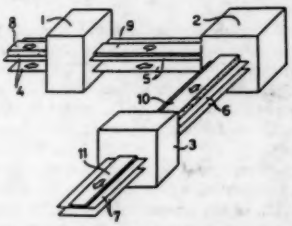
means for connecting said extension arm of said integral body to the plurality of louvers for simultaneous movement of the louvers such that as said body pivots between the first lever position and the second lever position the louvers simultaneously move between the first and second positions to vary the air flow through the damper.

4,907,501

SYSTEM FOR FORMING A LAMINATE OF DOUGH AND FAT

Cornelis Rijkaart, Kortenhoef, Netherlands, assignor to Machinefabriek C. Rijkaart B.V., Netherlands

Filed Jan. 23, 1989, Ser. No. 299,703
Claims priority, application European Pat. Off., Jan. 26, 1988, 88200126
Int. Cl.[4] A21C *3/02, 15/00;* A23P *1/00*
U.S. Cl. 99—450.1 17 Claims



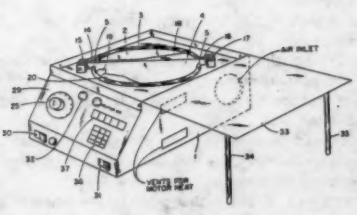
1. System for forming a laminate consisting of dough and fat, comprising first and second reducing means which are each suitable for receiving a first and second ingoing layer consisting of dough and fat and for delivering a first and second outgoing layer respectively being less thick than the respective ingoing layers, a laminating station which is suitable for receiving the first outgoing layer, and for partially placing on each other parts of the first outgoing layer for forming and delivering the second ingoing layer, first and second conveyer means for conveying the first ingoing layer and the first outgoing layer in the same directions of conveyance, and third and fourth conveyance means for conveying the second ingoing layer and the second outgoing layer in parallel directions of conveyance whereby the first and second reducing means are disposed in a single reducing station, the laminating station is suitable for delivering the second ingoing layer in a direction of conveyance opposed to the first outgoing layer, and the conveyance means are arranged essentially in one vertical plane.

4,907,502

HOME CHOCOLATE PROCESSING APPARATUS

Francis H. Snyder, Jr., Danbury, Conn., assignor to Olaf Kayser, Stamford and George Meyerie, Brookfield, both of, Conn.

Continuation-in-part of Ser. No. 796,000, Nov. 7, 1985, Pat. No. 4,706,558. This application Oct. 5, 1987, Ser. No. 105,546
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] A23G *1/00*
U.S. Cl. 99—455 13 Claims



1. A chocolate processing apparatus, comprising:

a casing suitable for home use and having a surface with an opening;

a bowl having a cavity in which chocolate is to be processed; said bowl being easily removably mountable in the opening

of the casing while being shaped to enable rotation when mounted in the opening;

releasably mounted baffle means extending into the cavity of the bowl to establish a first region where bulk chocolate is to be placed and a second region where a pool of molten chocolate is to form;

means in said casing to releasably couple to the bowl and cause relative rotation between the bowl and the baffle means;

heating means for generating heat and directing said heat at the bowl;

means for effectively sensing the temperature of chocolate in the molten pool and producing a temperature signal representative thereof;

means for generating an ambient air flow and directing said air flow at the bowl without the influence of waste heat generated by said means for causing said relative rotation; and

control means responsive to the temperature signal for controlling said heating means to establish a desired heating and cooling of the temperature of the chocolate in the molten pool so as to form tempered chocolate.

4,907,503

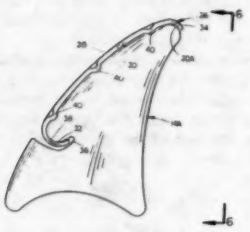
REMOVABLE TOOTH CAP FOR USE ON THE ROTOR OF AN AGRICULTURAL FEED BAGGER

Kelly P. Ryan, P.O. Box 488, Blair, Nebr. 68008

Filed Feb. 24, 1989, Ser. No. 314,804

Int. Cl.[4] A01F *25/16;* **B65G** *3/04;* **B30B** *5/00;* **B65B** *1/04*

U.S. Cl. 100—65 **3 Claims**



1. In an apparatus for loading feed stock into an agricultural bag having an inlet for introduction of the feed stock, said apparatus having a rotor with a rigid, generally cylindrical body having a rotational axis, a plurality of teeth fixedly attached directly to the rotor body and having a width in the axial direction of the rotor body, said teeth picking up and propelling feed stock generally radially with respect to the rotor body through the bag inlet as the rotor is operated, the improvement comprising:

a pusher plate means selectively removably secured to each of said teeth,

each of said pusher plate means having inner and outer ends, a front pushing surface, and a trailing back surface,

each of said teeth having a convex leading edge with inner and outer ends,

each of said teeth having an elongated opening formed therein which extends into the leading edge thereof outwardly of the inner end thereof,

the inner end of said pusher plate means being selectively removably received by said opening in the associated tooth and the outer end of said pusher plate means at least partially yieldably embracing the outer end of the associated tooth to cooperate to selectively maintain said pusher plate means on said tooth,

said pusher plate means having a width greater than the width of the associated tooth.

4,907,504

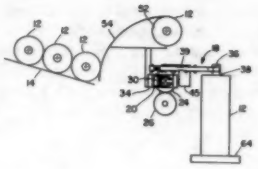
APPARATUS FOR REPOSITIONING CONTAINERS

Kenneth R. Harris, Byfield, Mass., assignor to Imtran Industries, Inc., Rowley, Mass.

Filed Jun. 8, 1988, Ser. No. 204,203

Int. Cl.[4] B41F *17/22;* **B65G** *47/91*

U.S. Cl. 101—40.1 **17 Claims**



1. Apparatus for moving a container from a first container position to a second container position in which said container is spaced from said first container position and in a different orientation, said apparatus comprising

a drive member that is rotatable about a first axis between a first drive member position and a second drive member position,

said first axis being spaced from said first container position,

a gripper for gripping said container,

said gripper being rotatably mounted on said drive member about a rotatable second axis that is transverse to said first axis and rotates with said drive member about said first axis,

said gripper being rotatable about said rotatable second axis between a first gripper position and a second gripper position, and

means for causing said gripper to rotate from said first gripper position to said second gripper position as said drive member rotates from said first driven member position to said second drive member position.

a container engaged by said gripper being in said first container position when said drive member and gripper are in their respective first positions and in said second container when said drive member and gripper are in their respective second positions.

4,907,505

STENCIL FRAME SECURING AND REGISTERING APPARATUS

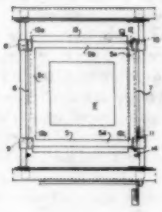
Sylve J. D. Ericsson, Tolléns väg 8, 147 00 Tumba, and Nils A. E. Lindström, Vårstigen 11, 144 00 Rönninge, both of Sweden

Continuation of Ser. No. 639,517, Aug. 8, 1984, abandoned, which is a continuation of Ser. No. 491,038, May 3, 1983, abandoned. This application Sep. 27, 1988, Ser. No. 251,069

Claims priority, application Sweden, May 5, 1982, 8202816-8

Int. Cl.[4] B41F *15/08*

U.S. Cl. 101—114 **2 Claims**



1. A device for securing and registering a stencil frame with a printing machine which screen prints on material, said screen printing machine provided with a printing table and a scraper

including an ink application device positioned above the printing table, positioned between the printing table and the scraper device one or more guides are provided so as to interact with the stencil frame so that the stencil frame is displaceable horizontally as a single unit to a printing position inside the screen printing machine and to a non-printing position outside the screen printing machine, registering means positioned inside the screen printing machine for guiding the stencil frame into a registration position, the guides interacting with the stencil frame being at least two guides running parallel to each other, along which the stencil frame is capable of being displaced, said registering means are provided for forcing the stencil frame against one of the guides for registration, a further guide extending between the guides and perpendicular to them, and means for forcing the stencil frame against the further guide for registration, wherein the displacement of the stencil frame is in a direction perpendicular to the direction of transport of the material via said guides positioned transversely across the machine, a number of cylinder and piston devices provided for forcing the stencil frame against the guides interacting with the stencil frame, said cylinder and piston devices capable of being activated after registration of the stencil frame, said guides positioned to cooperate with stencil feeding and discharge means adjacent said printing machine.

4,907,506

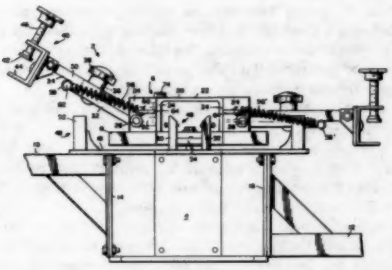
METHOD AND APPARATUS FOR CONTROLLING SPRING RATE AND LEVERAGE IN A SCREEN PRINTING DEVICE

Terry W. Davis, and James P. Gates, both of Glens Falls, N.Y., assignors to R. Jennings Manufacturing Co., Inc., Glens Falls, N.Y.

Continuation of Ser. No. 119,482, Nov. 12, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 338,371

Int. Cl.[4] B41F *15/10, 15/34*

U.S. Cl. 101—115 **31 Claims**



1. In a screen printing machine including a head and at least one screen frame holding arm pivotally mounted on said head for movement about an axis toward and away from a platen to lowered printing and raised non-printing positions, respectively, and including spring means associated with said at least one arm, said spring means attached at one end to first attachment means located on said at least one arm and at another end to second attachment means located on said head for controlling the movement of said at least one arm; the improvement comprising

means for adjusting the spring rate of said spring means and for creating varying degrees of leverage to facilitate movement of said arm toward and away from said platen, such that said spring means alone will maintain the arm in the lowered printing position and in the raised non-printing position.

4,907,507

OPERATING LEVER MECHANISM FOR OFFSET PRINTING PRESS

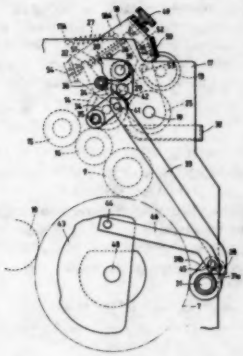
Koji Ishii, and Naoki Ikeda, both of Fuchu, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Apr. 28, 1989, Ser. No. 344,578

Claims priority, application Japan, May 6, 1988, 63-110723

Int. Cl.[4] B41F *7/06, 7/40, 31/30*

U.S. Cl. 101—142 **8 Claims**



1. An offset printing press having a plate cylinder, a blanket cylinder, an impression cylinder, a paper feed mechanism including a suction foot and a pump drive motor for generating negative pressure in the suction foot, a printer drive motor, an inking roller system, a dampening roller system, the inking roller system including ink applicator rollers in contact with the plate cylinder, and the dampening roller system including a fountain roller, a metering roller in rotational contact with the fountain roller, a water distributor roller in rotational contact with the fountain roller, a water delivery roller in rotational contact with the water distributor roller, and a water applicator roller in rotational contact with the water delivery roller for applying water to the plate cylinder, each of said cylinders having a shaft and each of said rollers having an axis about which it may be rotated, the offset printing press comprising;

a first pair of frames for rotatably supporting said inking roller system and for rotatably supporting said water delivery roller, said water applicator roller, said plate cylinder, said blanket cylinder, and said impression cylinder;

a second pair of frames for rotatably supporting said metering roller, and said water distributor roller, said second pair of frames being pivotally connected to said first pair of frames by pivot pins, said pivot pins being aligned to define a pivoting axis, the axis of rotation of said fountain roller being coaxial with said pivoting axis defined by said pivot pins;

first biasing means connected between said first and second pair of frames for normally urging said second pair of frames toward a first direction so that said water distributor roller on said second pair of frames is brought into contact with said water delivery roller;

an operation shaft rotatably extending through said first pair of frames;

an operating lever fixedly connected to said operation shaft;

a drive source drivingly connected to said fountain roller for rotating said fountain roller about its axis of rotation;

gear trains for driving said metering roller and said water distributor roller to rotate, each about its axis of rotation, in cooperation with said fountain roller;

a positioning cam member fixedly connected to said opera-

tion shaft for defining a plurality of tilting stages of said operating lever;

a plurality of cam members rotatably supported by said first pair of frames;

abutting members connected to said second pair of frames, said cam members being abuttable on said abutting members; and

a plurality of first link members each having first and second end portions said first end portion being rotatably connected to said operation shaft and said second end portion being rotatably connected to one of said cam members, so that said cam members may be brought into abutment with said abutting members to pivot said second pair of frames in a second direction against the biasing force of said first biasing means, so that said water distributor roller is moved away from said water delivery roller.

4,907,508

PRINTING CYLINDER WITH RUBBER COATING FOR LETTERPRESS, FLEXOGRAPHY, ROTOGRAVURE AND ROTARY OFFSET

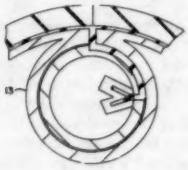
Joachim Patschorke, Brunnen, Switzerland, assignor to Celfa AG, Seewen, Switzerland

Filed Nov. 17, 1988, Ser. No. 273,383

Claims priority, application European Pat. Off., Nov. 24, 1987, 87117263.1

Int. Cl.[4] B41C *1/02*

U.S. Cl. 101—401.1 **7 Claims**



1. In a printing cylinder with a rubber coating for letterpress, flexography, rotogravure, and rotary offset and having a tensioning channel, the improvement wherein the coating has an outer layer and an inner layer, the outer layer of the rubber coating being shorter at the tensioning-in edges than the inner layer and being at an angle of at most 90° to it at both ends, and having a non-twisting tensioning mechanism with a narrowed introduction slot at the tensioning channel.

4,907,509

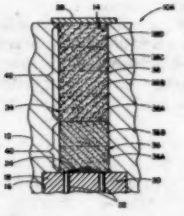
BONFIRE-SAFE LOW-VOLTAGE DETONATOR

Morton L. Lieberman, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 1, 1988, Ser. No. 214,369

Int. Cl.[4] F42B *3/18, 3/10*

U.S. Cl. 102—202.1 **9 Claims**



1. A bonfire safe detonator having a housing with a bore therein, a header supported by said housing and mounting an electrical ignition device in communication with and adjacent to an end of said housing bore, and a column of explosive comprising:

(a) a first layer of an explosive charge of CP disposed in said housing bore in an ignition region of said explosive column adjacent to and in contact with said ignition device; and

(b) a second layer of a secondary organic explosive charge disposed in said housing bore in a transition region of said explosive column and on a side of said first layer opposite from said ignition device and in contact with said first layer;

(c) said organic explosive charge of said second layer having a degradation temperature which is lower than an autoignition temperature of said CP explosive charge of said first layer.

4,907,510

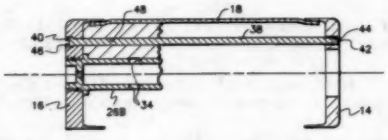
CASED TELESCOPED AMMUNITION HAVING FEATURES AUGMENTING CARTRIDGE CASE DIMENSIONAL RECOVERY BY CENTER SLEEVE

Wilford E. Martwick, Minneapolis, and Brian B. Tasson, Anoka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 10, 1988, Ser. No. 154,416

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—434 **5 Claims**



1. In a cased telescoped ammunition round, the combination comprising:

(a) an elongated propellant charge having an axial bore therethrough;

(b) an elongated tubular case having opposite ends and defining a chamber that contains said propellant charge;

(c) a center sleeve disposed in said case through said axial bore of said propellant charge and attached at its opposite ends to said opposite ends of said case;

(d) a projectile housed within a forward portion of said center sleeve;

(e) a primer positioned within an aft portion of said center sleeve and being actuatable for igniting said propellant charge for causing first of said projectile forwardly from said center sleeve and said case; and

(f) resiliently-yieldable annular-shaped spring means extending between said forward and aft portions of said center sleeve and interconnecting said center sleeve portions at respective outer and inner peripheries of said spring means, said spring means having an inclined cross-sectional configuration extending from its outer peripheral edge to its inner peripheral edge in a direction pointing axially away from said aft portion of said center sleeve for resisting stretching and augmenting contraction thereof.

4,907,511

LIQUID PROPELLANT GUN

Melvin J. Bulman, Shelburne, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 178,254, Aug. 7, 1980. This application Jun. 4, 1984, Ser. No. 639,647

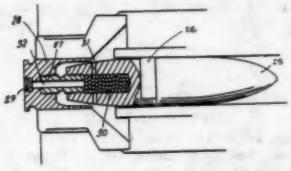
Int. Cl.[4] F42B *15/16*

U.S. Cl. 102—440 **2 Claims**

1. A round of ammunition comprising:

a cartridge case,

a projectile,
a rupturable element interconnecting said case and said projectile,
a primer disposed in the base of said case,



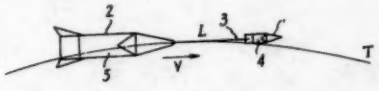
a booster charge disposed in said projectile,
a passageway interconnecting said primer and said booster charge.

4,907,512

TANDEM PROJECTILES CONNECTED BY A WIRE

Francois Arene, Paris, France, assignor to Societe d'Etudes, de Realisations et d'Applications Techniques, Paris, France

Filed Jan. 6, 1988, Ser. No. 141,270
Claims priority, application France, Jan. 14, 1987, 87 00319
Int. Cl.[4] F42B *13/50, 13/56*
U.S. Cl. 102—476 **18 Claims**



1. A system of tandem charge projectiles, of the type to be projected by a launcher along a trajectory and intended for attacks on armored vehicles, the armor on the vehicles having a predetermined life, the tandem charge projectiles comprising two separate projectiles comprising a front projectile and a rear projectile each projectile including an explosive effect charge, said front and rear projectiles being connected by a connecting wire, the length (L) of the wire and the velocity (V) of the projectiles being determined such that the relationship (L)/(V) is greater than said predetermined life ($\Delta\tau$) of the armor to be attacked, and means for projecting the front projectile from the launcher, with an additional initial velocity (ΔV_0) with respect to an initial velocity (V_0) of the rear projectile, so that the rear projectile follows the front projectile.

4,907,513

HIGH VOLUME OBTURATOR ASSEMBLY METHOD

Michael C. Manion, and Vernon C. Ralph, both of Hopkins, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 18, 1988, Ser. No. 195,322
Int. Cl.[4] F42B *31/00;* **B32B** *31/16*
U.S. Cl. 102—527 **7 Claims**

1. A method of manufacturing a despun type obturating band for a projectile assembly, comprising the steps of:
forming a polymer pre-band including a male connector on a first free end and a female receptacle on a second free end, said first free end and said second free end being formed to allow for an overlapping section, said male connector being oversized for said female receptacle;
positioning said polymer pre-band in alignment with a band seat in said projectile assembly;
closing said polymer pre-band within said band seat such that said male connector is in alignment with said female receptacle; and
welding said first free end and said second free end together whereby a continuous ring obturating band is formed.

5. A polymeric pre-band for forming a despun type obturating band within a channel around the circumference of a projectile assembly, comprising:
a "C" shaped open ring having first and second free ends;
a two tiered male connector integrally formed on a first indented section on said first free end, a first tier of said

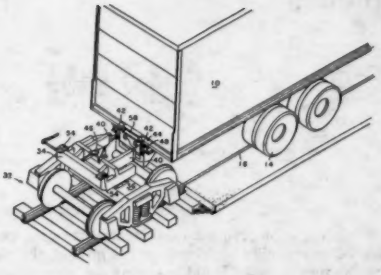
two tiered male connector having a smaller crosssectional area than a second tier of said two tiered male connector, said second tier being positioned between said first tier and said first indented section; and
a female receptacle created in a second indented section on said second free end, said two tiered male connector being oversized for said female receptacle, whereby a scarf joint is formed upon welding said two tiered male connector to said female receptacle.

4,907,514

TRAIN OF HIGHWAY TRAILERS AND METHOD OF MAKING

Harry O. Wicks, and Monte P. Riefler, both of Hamburg, N.Y., assignors to RailMaster System, Inc., Elmhurst, Ill.

Continuation of Ser. No. 900,547, Aug. 26, 1986, Pat. No. 4,766,818, which is a continuation of Ser. No. 740,650, Jun. 3, 1985, Pat. No. 4,669,391, which is a continuation-in-part of Ser. No. 469,215, Feb. 24, 1983, abandoned. This application Jun. 10, 1988, Ser. No. 204,892
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—4.3 **8 Claims**



1. A railway train comprising at least one end to end trailer each having its highway engaging wheels supported above a railway track, a railway truck having railway wheels on the track and a bolster with a load carrying thrust bearing, an adapter frame supported by said bearing for rotation about a vertical axis and having laterally spaced horizontal load carrying twin forks on opposite sides of the centerline of said one of said trailers and in load carrying relation to one end of said one of said trailers, said twin forks being receivable in sockets at the back end of said one of said trailers whereby said adapter frame is releasably couplable to said one of said trailers.

4,907,515

SHIPPING PALLET AND THE LIKE AND METHOD OF FORMING SAME

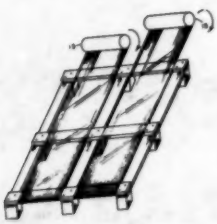
Michael M. Win, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1984, Ser. No. 661,984

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] B65D *19/00*

U.S. Cl. 108—51.1 **2 Claims**



1. A process for preparing a shipping pallet comprising:

(a) arranging a plurality of elongated narrow stringers in parallel, spaced relation;

(b) arranging a plurality of elongated narrow runners in parallel, spaced relation substantially at right angles to said stringers so as to form the perimeter of a plurality of comparatively broad rectangles;

(c) providing spacer means defining fork lift openings in the sides of the pallet;

(d) overwrapping said plurality of comparatively broad open spaces framed by said stringers and runners with a plurality of layers of heat shrink wrap film; and

(e) subjecting said film to sufficient heat to shrink the same to a taut, product supporting condition.

4,907,516

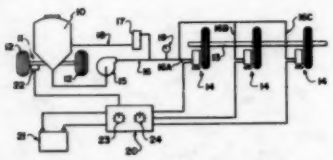
PULSED INJECTION INTO THE GROUND OF LIQUID FERTILIZER

Ramon B. Rogers, 1510 Hilliard Street, E. Saskatoon, Saskatchewan, Canada S7J 0G4

Filed Jun. 17, 1988, Ser. No. 208,216

Int. Cl.[4] A01C *23/02*; B05B *1/08*; F16K *31/06*

U.S. Cl. 111—127 **7 Claims**



1. A method of applying a crop treatment liquid into the ground for accessibility by a crop on the ground, the method comprising supplying the liquid in a container, transporting the container across the ground, pumping liquid from the container to an injection nozzle under a constant high pressure of the order of 6,000 psi, mounting the nozzle for movement across the ground at a substantially constant height closely adjacent the ground with the nozzle arranged in a direction to inject the liquid downwardly into the ground, passing the liquid through an orifice in the nozzle having a transverse dimension in the range 0.015 to 0.050 inches to generate a high velocity solid stream jet of the liquid such that the liquid is driven into the ground to a depth below the surface of the ground, providing a valve having a valve orifice and a valve closure member between the pump and the nozzle orifice at a position closely adjacent the nozzle orifice, supplying the constant pressure liquid to the valve, operating the valve closure member in timed sequence such that the valve orifice is opened in repeated cycles for a time less than 0.0057 seconds and is closed between each opening and the next for a time greater than the time it is opened such that the liquid flow is cyclically halted and restarted to generate spaced pulses of the liquid and passing the pulses from the valve directly to the orifice.

4,907,517

SEWING MACHINE WITH A DEVICE FOR GUIDING AN UPPER THREAD

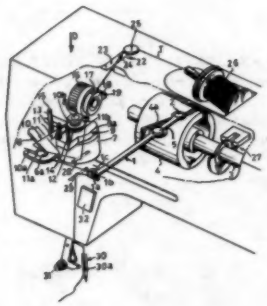
Susumu Hanyu, and Mikio Koike, both of Tokyo, Japan, assignors to Janome Sewing Machine, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,639

Claims priority, application Japan, Mar. 19, 1987, 62-62448

Int. Cl.[4] D05B *40/02*

U.S. Cl. 112—302 **17 Claims**



1. A device for guiding an upper thread through a guide path in a sewing machine from a thread source to a needle having a needle eye through which the upper thread extends, said device comprising:

a take-up lever including a thread holding end portion having an opening for receiving the upper thread, said take-up lever having a predetermined position in the guide path in which the upper thread passes through said opening;

first means for moving said take-up lever into and out of said predetermined position;

thread tension spring means having end portion means with opening means facing said opening in said thread holding end portion of said take-up lever; and

second means for moving said thread tension spring means between a stitching position and a position in which said thread tension spring means and said take-up lever are substantially lined up in a common plane when said take-up lever is in said predetermined position thereof to facilitate the insertion of the upper thread.

4,907,518

PLANING HULL FOR MULTI-HULL SAIL BOATS

George C. Tunis, III, 2908 Creekside Dr., Newark, Del. 19711

Filed Apr. 12, 1989, Ser. No. 336,917

Int. Cl.[4] B63B *1/10*

U.S. Cl. 114—56 **10 Claims**

1. A hull for a multi-hull sail boat, comprising:

(a) a relatively long high length to width ratio tapering curved hull with low hydrodynamic drag which has its maximum width approximately 60 percent of the distance from the bow to the stern,

(b) a flat downwardly extending inner side surface which curves outwardly from the bow to a maximum at the mid section of the hull and tapers inwardly slightly as it ap-

proaches the stern so that water passing over this surface creates a lifting force normal to the surface,

(c) the lowermost edge of the inner surface being the keel line of the hull,

(d) the outer surface of the hull being flat and extending vertically downward to terminate along a chine line,

(e) the depth of the outer side surface from the deck to the chine section being the desired free board,

(f) a bottom relatively flat planing surface extending downwardly from the chine section at a substantial and constant dead rise angle along the planing section of the hull,

(g) the dead rise angle increasing smoothly and progressively from the forward limit of the planing surface to the bow of the hull,

(h) the bottom having a slight upward bend at bow and stern to provide rocker, and

(i) the keel line having a three dimensional convex curvature in both the horizontal and vertical plane as a result of the intersection of the downward extending inner surface, and the dead rise planing surface extending from the chine.

4,907,519

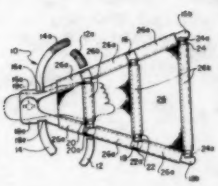
PROPULSION AIDS FOR ATTACHMENT TO A SWIMMER'S FEET

Yoram Gil, 1441 S. Beverly Glen Rd., Los Angeles, Calif. 90024

Filed Nov. 21, 1988, Ser. No. 274,396

Int. Cl.[4] A63B *31/00*

U.S. Cl. 441—61 **6 Claims**



1. In a flipper-type swimming propulsion aid assembly for attachment to each foot of a swimmer to increase the swimmer's effective foot area:

(a) a dismantlable frame comprised of side frame members of substantially equal length, said side frame members being pivotally joined at a heel end of said frame, and at least two cross frame members of progressively longer lengths adapted for removal joinder to said side frame members, the longest of said cross frame members joining free ends of the side frame members at a toe end of said frame with the result that said frame is of generally isosceles triangular configuration;

(b) a web component for said frame comprised of a flexible material selected from the group consisting of fabric and sheet plastic materials, said web component being of generally isosceles triangular configuration matching the configuration and size of said frame, said web component including side loops for receiving and maintaining the side frame members and including cross loops for receiving and maintaining the cross frame members, said cross frame members being of lengths such that upon the forced joinder of their ends to said side frame members said latter members are maintained pivoted outwardly to the maximum extent permitted by the web component and its side loops whereby said web component is stretched to its full triangular configuration;

(c) a foot strap extending through one of the cross loops of said web component for attachment to said web component and of a length in its opposite end portions extending from said cross loop sufficient to surround the forward portion of the swimmer's foot and connectively mate atop said foot; and

(d) an ankle strap affixed to said side frame members at the heel end of said frame and of a length in its opposite end portions sufficient to cross over the swimmer's foot in front of the ankles, cross around the swimmer's ankle and connectively mate behind the swimmer's leg.

4,907,520

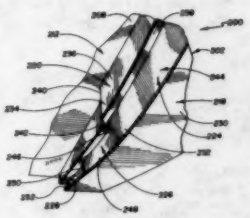
HIGH PERFORMANCE BOAT HULL WITH ANTI-SPIN SPONSON

Howard W. Pipkorn, 1622 Lake Johanna Blvd., Arden Hills, Minn. 55112

Filed Jun. 1, 1988, Ser. No. 200,822

Int. Cl.[4] B63B *1/20*

U.S. Cl. 114—61 **3 Claims**



1. An improved sponson for a tunnel hull boat, comprising:

a sponson bottom wall;

opposed inboard and outboard sponson sidewalls extending upwardly from said bottom wall, each of said sponson inboard sidewalls presenting spaced apart, generally vertical shear lines dividing the sponson into a sponson forward portion, a sponson middle portion, and a sponson rear portion,

the sponson forward portion including a downwardly sloped forward panel extending outboard towards said sponson bottom wall, and said sponson rear portion including a downwardly sloped rear panel extending inboard towards said sponson bottom wall.

4,907,521

LINE LOCK

John A. Kresse, 32 Alma Ave., Lake Grove, N.Y. 11755

Filed Oct. 17, 1988, Ser. No. 258,587

Int. Cl.[4] B63H *25/52*

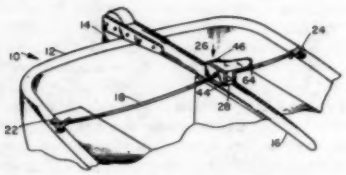
U.S. Cl. 114—162 **7 Claims**

1. Apparatus for selectively locking against movement a tiller having an arm extending into the interior of a boat having sidewalls, comprising:

a. means for supporting the ends of a line on said sidewalls, said line extending across the interior of said boat and over said tiller arm;

b. line lock means mounted on said tiller arm through which said line passes;

b. said line lock means comprising base plate means attached to said tiller arm, a pair of side panel means attached to the sides of said base plate means and extending upwardly, lock lever means pivotally mounted about a pin extending through said pair of side panels means and said base plate means, and locking member means mounted in one of said side panel means being pivoted between a first position blocking downward movement of said lock lever means



when in a raised position and a second position unblocking the downward movement of said lock lever means;

c. each of said side panel means and said locking lever means having holes aligned when said locking lever means is in the down position for said line to pass through and permitting said tiller arm to move freely along the length of said line thereby changing the position of said tiller, said line becoming pinched when said lock lever means is raised thereby preventing said tiller arm and said tiller from changing position, all of said side panel means, lock lever means, and said locking lever means lacking resiliency.

4,907,522

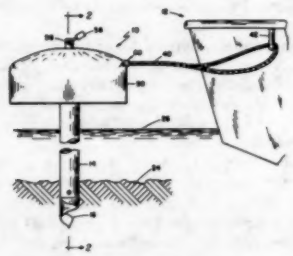
MOORING APPARATUS

John M. Lutzke, 3831 S. Gleaner, Saginaw, Mich. 48603

Filed Jan. 23, 1989, Ser. No. 300,378

Int. Cl.[4] B63B *21/04*

U.S. Cl. 114—230 **14 Claims**



1. Mooring apparatus comprising

a flaccid mooring line for coupling to an object, such as a boat, to be moored;

rigid pin means fixed to opposite ends of said line;

vertical support means, adapted to be implanted in a surface;

transversely extending means mounted on said support means including receptacle means on laterally opposite sides of said vertical support means for releasably receiving, through the upper ends thereof, said pin means; and

an open bottom security dome detachably rotatably mounted on said vertical support means and overlying said transversely extending means.

4,907,523

DRAG ANCHOR

Hans Claesson, Habsburgstrasse 17, CH-6045 Meggen, Switzerland

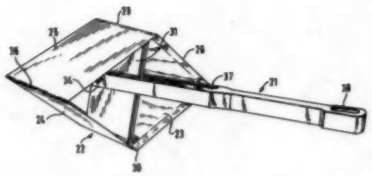
PCT No. PCT/SE87/00560, § 371 Date Jul. 5, 1988, § 102(e) Date Jul. 5, 1988, PCT Pub. No. WO88/04256, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 26, 1987, Ser. No. 216,629

Claims priority, application Sweden, Dec. 1, 1986, 8605135

Int. Cl.[4] B63B *21/44*

U.S. Cl. 114—304 **20 Claims**



1. A drag anchor, the shank (1; 21) of which is flexibly attached to the part (2; 22) which forms the fluke, characterized in that the part (2; 22) which forms the fluke consists of a hollow body open at its front and rear end in the direction (41) in which the shank (1; 21) is towed, that is to say the direction of movement of the drag, which hollow body forms a mantle enclosing the rear part of the shank, said shank extending in the direction of movement of the drag, and in that the shank (1; 21) is articulated in one plane and is attached to the mantle (3–6; 23–26) via a bearing device (11; 31) spanning its internal cavity centrally, taken in a transverse section relative to the direction of movement (41) of the drag, which bearing device consists of a wall said wall having at least one flat surface (11; 31) dividing the internal space of the hollow body and extending in the direction of movement (41) of the drag anchor and is so arranged as to provide lateral support for the shank (1; 21).

4,907,524

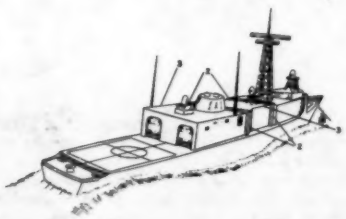
METHOD AND DEVICE FOR CONTROLLING STRAIN AND/OR DEFLECTION IN SUPERSTRUCTURES

David W. Hart, Wilmington, Del.; Bohdan Dunas, and Joseph Krulikowski, both of Philadelphia, Pa., assignors to Special Projects Research Corporation, Wilmington, Del.

Filed Aug. 5, 1988, Ser. No. 228,716

Int. Cl.[4] B63B *15/00*

U.S. Cl. 114—356 **5 Claims**



1. A stiffness tuned structural load carrying elastic device for use in and between spaced sections of a superstructure of a ship said device, consisting of joining sections, each formed with an offset discontinuity which are attached between sections of a superstructure of a ship which will allow a predetermined amount of strain and deflection and load between said sections of aid superstructure and will limit the initiation of new cracks

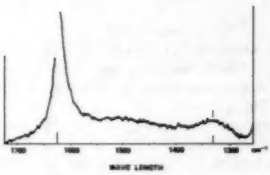
and the propagation of existing cracks and flaws in the said superstructure.

4,907,525

OUTBOARD STORAGE RACK FOR BOATS

James E. Schmidt, N. 6515 Moore, Spokane, Wash. 99208

Filed Jun. 27, 1988, Ser. No. 211,599
Int. Cl.[4] B60R *9/12*
U.S. Cl. 114—364 **16 Claims**



1. A rack for water swimming devices such as water skis mountable to a boat having a gunwale and a substantially upright hull side, the rack comprising:

a frame having a top end above the gunwale and a bottom end below the gunwale and including a top horizontal section at the top end, an outboard vertical section extending downwardly from the top horizontal section; and a bottom horizontal section extending outboard of the outboard vertical section at the bottom frame end;

clamp means at the top end of the frame, for releasably clamping the top end of the frame securely to the gunwale of the boat;

suction cup means at the bottom end of the frame for releasably attaching the bottom frame end to the upright hull side of the boat;

suction cup angle adjusting means at the bottom frame end mounting the suction cup means to facilitate angular adjustment of the suction cup means thereon to conform angularly with the upright hull side of the boat; and

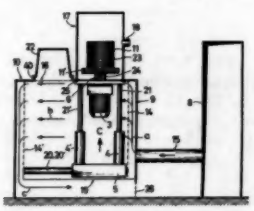
retaining means on horizontal sections of the frame for mounting water skimming devices such as pairs of water skis in horizontal and vertically spaced relation along the gunwale and outwardly thereof adjacent the upright hull side.

4,907,526

INSTALLATION FOR CHARGING AND DISCHARGING SUBSTRATES OUT OF A VACUUM TANK

Michael Walde, Rodenbach; Peter Zeidler, Hanau, and Dirk Domroese, Bispingen-Behringen, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 217,941
Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814924
Int. Cl.[4] B05C *13/00*
U.S. Cl. 118—50 **8 Claims**



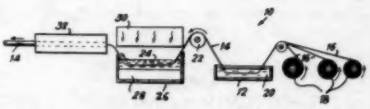
1. Apparatus for the charge and discharge of substrates in a vacuum tank having an opening, into a pre-chamber of a high vacuum processing chamber for treating the surfaces of the substrates, comprising: a substrate holder, a substrate store, an air lock plate onto which the substrate store can be disposed, a first housing having a charge opening, which is open towards a lower side of the first housing enclosing the store, the first housing having a rotatable lower border, a lower box enclosing the apparatus and having a wall having an upper portion on which the rotatable lower border rests, means for moving the air lock plate vertically and horizontally, the first housing resting sealingly on the lower box and closing the charge-opening for the substrate store, said means for moving the air lock plate being positioned to move the air lock plate to the opening of the tank, the opening of the tank being connected to the lower box and being closable.

4,907,527

PULTRUSION APPARATUS AND METHOD FOR IMPREGNATING CONTINUOUS LENGTHS OF MULTI-FILAMENT AND MULTI-FIBER STRUCTURES

William Hilakos, Mt. Vernon, and Dwight J. Patterson, Evansville, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 15, 1987, Ser. No. 133,419
Int. Cl.[4] B05C *3/12*
U.S. Cl. 118—67 **3 Claims**



1. Pultrusion assembly for impregnating a continuous length of multifilaments or multifibers, which comprises;

(a) a polymerization initiator bath vessel;

(b) a molten thermoplastic prepolymer resin container;

(c) a heat zone for polymerizing molten thermoplastic prepolymer resin; and

(d) means for tracting the continuous length of multifilaments or multifibers sequentially through the bath vessel, the resin container and the heat zone.

4,907,528

DEFLECTION COMPENSATING DEVICE FOR A SMOOTHING DEVICE FOR A COATING APPLYING UNIT

Hans-Peter Sollinger, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jun. 7, 1988, Ser. No. 203,436
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719276
Int. Cl.[4] B05C *11/04*
U.S. Cl. 118—121 **20 Claims**

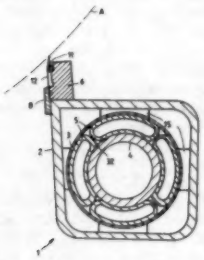
1. A smoothing device for a unit that applies a coating to a moving web of material, the smoothing device comprising:

a support beam which extends in its length direction across the web; a doctor for the coating material extending toward the web and extending across the direction of the web; holding means to which the doctor is supported, and the holding means being supported on the support beam and extending along the support beam for supporting the doctor, whereby the force applied to the doctor by the web is transmitted through the holding means to the beam;

a central support member disposed in the beam and extending axially along the length thereof;

an external tube around the central support member and radially spaced therefrom; means connecting the support beam to the external tube, whereby the external tube supports the beam;

at least two rows of pressure medium activated pressing elements which are arranged parallel to the axis of the beam and extending along the beam disposed between the support member and the external tube and being actuatable for supporting the external tube for in turn supporting the beam against undesired flexion;



wherein the pressing elements comprise a plurality of pressure holes, each adapted to expand upon being pressurized; and

wherein the pressing hoses are paired, and further comprising means for pressurizing the pressing hoses which pressurizes them in their pairs, wherein each pair comprises a respective pair of opposite pressing hoses.

4,907,529

APPARATUS FOR CONTROLLING THE TILT ANGLE OF A DOCTOR BLADE

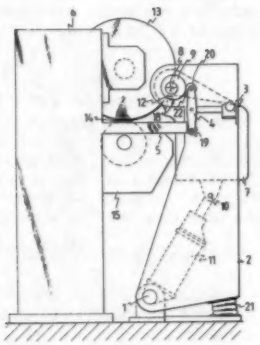
Aaron Mannio, Järvenpää , Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Sep. 7, 1988, Ser. No. 241,199

Claims priority, application Finland, Sep. 7, 1987, 873869

Int. Cl.[4] B05C *11/04*

U.S. Cl. 118—126 **4 Claims**



1. An apparatus for controlling the tilt angle of a doctor blade relative to a backing roll in a coating mix applicator, said apparatus comprises

a support, blade supporting beam,

a doctor blade supported by the blade supporting beam, said blade supporting beam being pivotally mounted to the support about a bearing point which is located near the tip of the doctor blade,

a guiding cam fixed at the bearing point to the beam,

a first actuator fixed to the support, said first actuator resting against a guiding surface of said guiding cam,

a second actuator operatively attached between the blade supporting beam and the support, said cam being fixed to said blade supporting beam at a point about which the beam is rotated by said second actuator, whereby the distance between the contact point of the first actuator with the cam and the bearing point changes as a function of the rotation of the blade supporting beam, so that the rotation of the blade supporting beam about the bearing point by the second actuator controls said distance between the contact point and the bearing point, as determined by the shape of the guiding cam.

4,907,530

APPARATUS FOR APPLYING A LIQUID TO A SUPPORT

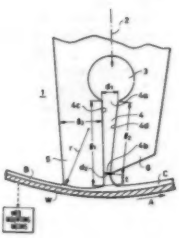
Norio Shibata; Hideo Takeda, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 73,660, Jul. 15, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,621

Claims priority, application Japan, Jul. 15, 1986, 61-164719

Int. Cl.[4] B05C *1/04, 1/16*

U.S. Cl. 118—410 **7 Claims**



1. An apparatus for applying a coating composition to an upper surface of a substrate to form a coated layer of a predetermined thickness thereon, said apparatus comprising: an extrusion head, means for mounting a substrate web for movement in a feed direction with respect to said extrusion head, such that said extrusion head is disposed above said web and including a front wall and a rear wall respectively located upstream and downstream with respect to the feed direction, a downwardly tapering coating composition slot defined by and between said front and rear walls, said slot being disposed transverse to said web and having a width which decreases approaching an exit end thereof, coating composition, means for supplying said coating composition to said slot, said front wall having a lower surface convexly curved toward said upper surface of said substrate and disposed in contact therewith, and said rear wall having a lower slot exit edge facing said upper surface and vertically raised above a rear edge of said front wall opposite the edge defining the exit end of said slot by a distance substantially greater than said predetermined thickness such that said exit edge of said rear wall does not limit or determine the thickness of the coated layer formed on the upper surface of the substrate.

4,907,531

DRAWDOWN MACHINES

Vazgen J. Houssian, 380 Mountain Rd., Union City, N.J. 07087

Filed Oct. 12, 1988, Ser. No. 256,736

Claims priority, application United Kingdom, Oct. 12, 1987, 8723921

Int. Cl.[4] B29C *1/06*

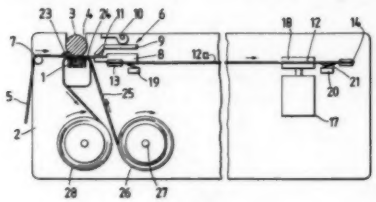
U.S. Cl. 118—413 **15 Claims**

1. Apparatus for coating a receptor sheet comprising:

sheet support means;

a coating bar arranged to rest on a portion of a sheet on top of the sheet support means to define a nip therebetween;

a movable sheet clamp for releasably receiving the sheet; and



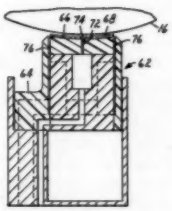
actuation means for effecting movement of the sheet clamp to pull the sheet through the nip.

4,907,532

ENDLESS BELT DEVELOPMENT ELECTRODE FOR ELECTROGRAPHIC IMAGE

Valdis Mikelsons, Mendota Heights; Lawrence M. Lucking, May Township, Washington County, both of Minn., and Gregory L. Zwadlo, Ellsworth, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 23, 1988, Ser. No. 235,939
Int. Cl.[4] G03G *15/10*
U.S. Cl. 118—659 **2 Claims**



1. A development apparatus for the application of liquid toner to the surface of a cylindrical electrographic record bearing member comprising:

an endless belt tensioned between at least two rollers and driven for movement with respect to said cylindrical record bearing member, said belt being positioned with respect to said record member such that a portion of said belt is in spaced, operative proximity to said record member to produce a development gap between said record bearing member and said belt and wherein the longitudinal axis of said portion of said belt in operative proximity of said cylindrical record member is parallel to the axis of said record member;

a shroud surrounding said belt and said drive rollers for containing said liquid toner;

means for providing a continuous supply of said liquid toner to said development gap forcing said liquid toner into said development gap; and

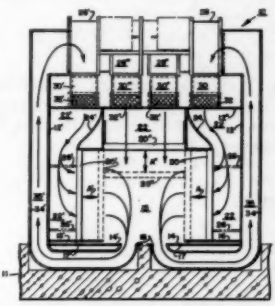
a base supporting said belt opposite said record member for maintaining the shape of said belt and providing a uniform development gap between said belt and said record member.

4,907,533

AUTOMOTIVE COATING TREATMENT APPARATUS WITH PLURAL RADIANT LAMPS

James S. Nelson, Moundsview; Scott L. Angell, New Hope; Jack E. Mannerud, Plymouth, and Charles H. Bergman, New Brighton, all of Minn., assignors to BGK Finishing Systems, Inc., Minneapolis, Minn.

Continuation of Ser. No. 905,289, Sep. 8, 1986, Pat. No. 4,771,728. This application Apr. 1, 1988, Ser. No. 176,727
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—663 **20 Claims**



1. An automobile body coating treatment apparatus for heat treating a coating applied to an automobile body, said apparatus comprising:

wall means for defining a volume sized to receive an automobile body of predetermined dimensions and having an applied coating;

a plurality of stationary radiant heat producing lamps, said lamps grouped in a plurality of distinct zones with lamps of a given zone being controllable independently of lamps of other zones contiguous to said given zone, said given zone controllable for a heat intensity emitted by said given zone being, at an option of a controller, different from an intensity emitted by said other zones; and

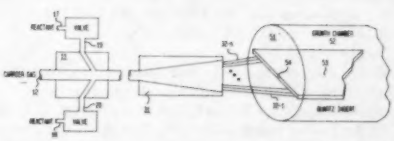
control means responsive to predetermined characteristics of an automobile body and positioning of said body in said volume to separately control said zones to uniformly heat treat said coating to a predetermined state of treatment.

4,907,534

GAS DISTRIBUTOR FOR OMVPE GROWTH

Rong-Ting Huang, Highland Park, and Dumrong Kasemset, Hopewell, both of N.J., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,082
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—725 **7 Claims**



1. Organometallic vapor phase epitaxy (OMVPE) apparatus for growing epitaxial layers on semiconductor wafers, the apparatus comprising:

a radial gas injection manifold having a plurality of ports for receiving reactant gas and a port for receiving a carrier gas and producing a gas output;

a growth chamber having a confined volume for receiving at least one semiconductor wafer, the growth chamber hav-

ing a recess for receiving a quartz insert to provide the confined volume, the recess having a plurality of aperatures equally distributed in a bottom portion of the recess; and

gas distributing means located between the manifold and the growth chamber comprising an expansion chamber connected to receive the gas output at one end and having a plurality of equally distributed ports at another end of the expansion chamber and a plurality of tubes wherein each tube extends from each of the ports to one of the plurality of apertures, and the plurality of tubes have the same length for producing a laminar gas flow inside the quartz insert of the growth chamber.

4,907,535

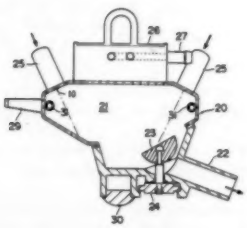
MILK-CLAW FOR MILKING MACHINES

Minoru Matsuzawa, Nagano; Shigetada Tsuchiya, and Toshiyuki Okatani, both of Suzaka, all of Japan, assignors to Orion Machinery Co. Ltd., Suzaka, Japan

Filed Jun. 1, 1988, Ser. No. 203,051

Int. Cl.[4] A01J *5/00*

U.S. Cl. 119—14.55 **5 Claims**



1. A milk-claw for a milking machine, comprising:

a housing having an inner surface bounding and enclosing a milk collecting chamber, said housing having an upper part and a lower part below said upper part;

at least one liner nipple in said upper part, communicating with an upper end of said chamber; and

a milk tube nipple in said lower part, communicating with a lower end of said chamber;

said inner surface having a polygonally shaped vertical cross section, said inner surface having a polygonally shaped horizontal cross section so that said inner surface obstructs milk entering said chamber via said at least one liner nipple from forming a whirlpool.

4,907,536

ISOLATING CONTAINER FOR LIVE ANIMALS

Tanner S. Chrisler, 5044 Westminster, St. Louis, Mo. 63108

Continuation-in-part of Ser. No. 21,221, Mar. 3, 1987. This application Jan. 19, 1988, Ser. No. 145,131

Int. Cl.[4] A01K *1/00*

U.S. Cl. 119—15 **51 Claims**

1. An isolating container for live animals comprising a container body and a closure therefor, said container body having an aperture therein for introduction and removal of animals, said closure being adapted for attachment to the container body to close the aperture, said body and said closure defining an envelope which totally encloses the interior space within the container when the closure is attached to the body, said envelope comprising means permeable to air and carbon dioxide but impervious to microorganisms so that oxygen may pass into said interior and exhalation gases may pass out of said interior through said means without passage of microorganisms into or out of said interior, said air-permeable means comprising a fibrous mat having an apparent density of between about 0.200 g/cm^3 and about 0.400 g/cm^3 and an air permeability of between about 45 and about 200, said mat comprising cellulosic fibers having an average length of between about 0.52 mm. and about 0.72 mm., and an average width of between about 0.018 mm. and about 0.024 mm.

4,907,537

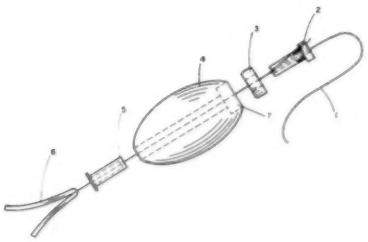
CAT TOY

Charles A. Shirk, 2208 Kornegay Dr., Raleigh, N.C. 27603

Filed Jun. 20, 1988, Ser. No. 208,971

Int. Cl.[4] A01K *15/02*

U.S. Cl. 119—29 **1 Claim**



1. A toy for amusing cats, comprising:

(a) an ovate shaped body with a center bore along the longitudinal axis thereof and further having a recessed area at one end centered around said bore;

(b) a weight positioned in said recessed area, said weight having a cylindrical hole therein;

(c) a front plug inserted in said hole of said weight, said front plug having a center hole therein;

(d) a rear plug inserted in the other end of said bore, said rear plug having a center hole therein;

(e) a tail means comprising an elongated strip member folded in half along its transverse axis;

(f) a string attachment means entering through said hole of said front plug and passing along said bore and through said hole of said rear plug and engaging said folded strip member in a looping fasion, said string member engaging said front and rear plugs in an opposing fashion such that said tail means and said weight are interconnected onto said ovate body.

4,907,538

MULTIPLE BIN COW FEEDER

Fred J. Helmle, and Scott M. Helmle, both of Little Suamico, Wis., assignors to Little Suamico Products Inc., Little Suamico, Wis.

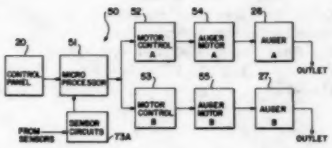
Filed May 9, 1988, Ser. No. 190,773

Int. Cl.[4] A01K *5/00*

U.S. Cl. 119—51.01 **9 Claims**

1. A moveable feed cart including compartments for receiving feed, rechargeable battery means mountable on said cart,

hydraulic fluid power means for propelling said cart and driven by said fluid power means, auger means driven by said



fluid power means and operable to dispense feed from said compartments, and a microprocessor based control means for controlling the operation of said augers.

4,907,539

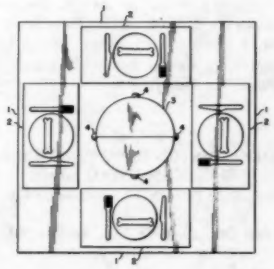
PET FOOD BOWL AND MAT

Fadia N. Abulhasan, 4121 Mt. Atlas La., Haymarket, Va. 22069

Filed Dec. 12, 1988, Ser. No. 283,072

Int. Cl.[4] A01K *5/00*

U.S. Cl. 119—52.1 **1 Claim**



1. In combination with a pet feeding receptacle, a flexible floor mat having a central portion, a length and width with at least one side having a graphically depicted plate and utensils, said graphic depiction placed near and along a longitudinal length of said mat,

said mat having an integral means for securing the pet receptacle in the central portion of the mat.

4,907,540

APPARATUS AND METHOD FOR REMOVING CAT HAIR

Evan B. Reynolds, 6691 Smokewood Cir., Anaheim Hills, Calif. 92807

Filed Sep. 8, 1987, Ser. No. 93,751

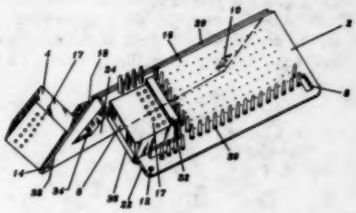
Int. Cl.[4] A01K *13/00*

U.S. Cl. 119—86 **9 Claims**

1. An apparatus for eliminating loose hair from an animal such as a cat or the like, comprising:

a first plate formed to include a plurality of bristles extending therefrom for removing loose hair from the animal; and

a second plate connected to the first plate and forming a mounting bracket for fastening the first plate to an object



such as a wall or the like so that the bristles are easily accessible to the animal.

4,907,541

PET RESTRAINT

Paul L. Thompson, P.O. Box 146, Tijeras, N. Mex. 87059

Continuation-in-part of Ser. No. 874,518, Jun. 16, 1986, abandoned. This application Aug. 17, 1988, Ser. No. 233,480

Int. Cl.[4] A01K *3/00, 27/00*

U.S. Cl. 119—96 **3 Claims**

1. An improvement in a pet restraint for use in a vehicle having passenger seat belts consisting of anchor straps that terminate in a fastening device to hold the passengers within the vehicle, the improvement comprises a harness formed of a flexible belly band extending around the underside of a pet, a flexible chest band secured to said belly band at right angles thereto, a collar band bridging said chest band and extending across said pet, said collar band in spaced angular relation to said belly band, a clasp joining member interconnecting said belly band and said collar band to a seat belt blade on said clasp joining member, means for adjusting said belly band in relation to said pet.

4,907,542

CLEANING SYSTEM FOR A HORIZONTAL TYPE TUBE ASSEMBLY

Takuzo Maeyama; Kenichi Nii; Shigeru Shimojo, all of Osaka; Keiichi Iwamoto, and Masaaki Torichigai, both of Nagasaki, all of Japan, assignors to The Kansai Electric Power Co., Inc., Osaka and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 17, 1989, Ser. No. 326,043

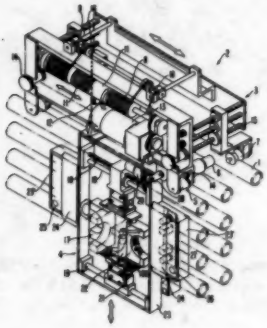
Claims priority, application Japan, Mar. 17, 1988, 63-61947; Mar. 17, 1988, 63-61948

Int. Cl.[4] F22B *37/18, 37/48*

U.S. Cl. 122—379 **2 Claims**

1. A cleaning system for a horizontal type tube assembly;

characterized by the provision of a cleaning main body section including a cleaning jig for an outer surface of a tube, a screw and a motor in combination for reciprocating said cleaning jig in the axial direction of said tube, another motor for diverting the direction of said cleaning jig, and a support plate for supporting the aforementioned members; and an upper traversing section including a winding drum, lifting wires and a winding



motor in combination for raising and lowering said cleaning main body section to any arbitrary height, a traveling roller for moving in the axial direction of the tube, and a drive motor for driving said traveling roller; said cleaning main body section further including a sensor for detecting the tube during rising and lowering of said cleaning main body section, and an urging plate which is mounted to said cleaning main body section via an expansible and contractible cylinder.

4,907,543

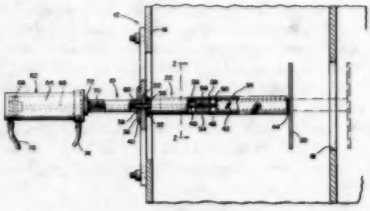
BOILER AIR PORT CLEANER

Joseph G. Matranga, 5015 N. Hillwood Cir., Mobile, Ala. 36608, and Gary W. Lewis, 308 S. Santos Dr., Mobile, Ala. 36619

Filed Nov. 7, 1988, Ser. No. 268,473

Int. Cl.[4] F22B *37/48*

U.S. Cl. 122—379 **7 Claims**



1. A boiler air port cleaner comprising a rigid, one-piece plate-like cutter having a periphery corresponding with the periphery of the air port in the boiler and being slightly smaller for reciprocating movement through the air port to remove solidified slag from the periphery of the air port, an elongated actuating member rigidly attached to said cutter, rigid guide means slidably receiving said actuating member for guiding the actuating member during reciprocation and power means connected with the actuating member for rreciprocating the actuating member and cutter, said guide means including a mounting plate adapted to be mounted detachably to an outer wall of a boiler with the cutter in alignment with an adjacent air port in an inner wall of the boiler.

4,907,544

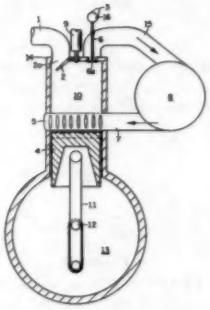
TURBOCHARGED TWO-STROKE INTERNAL COMBUSTION ENGINE WITH FOUR-STROKE CAPABILITY

Robert W. Burrahm, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 6, 1989, Ser. No. 334,449

Int. Cl.[4] F02B *19/02*

U.S. Cl. 123—26 **6 Claims**



6. In a turbocharged two-stroke internal combustion engine without crankcase scavenging and having means for operating the exhaust valves in accordance with either two-stroke or four-stroke operation, a means for enabling the intake of combustible gas into cylinders of the engine during four-stroke operation through a port in each cylinder from a combustible gas source, comprising a valve mounted on each port responsive to pressure within the cylinder.

4,907,545

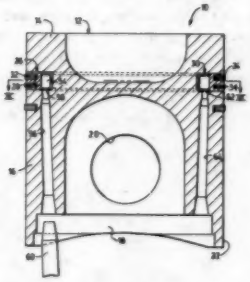
LIQUID COOLED PISTON RING CARRIER ASSEMBLY AND PISTON USING SAME

Floyd D. Mills, King Ferry, N.Y., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 28, 1988, Ser. No. 291,091

Int. Cl.[4] F01P *1/04*

U.S. Cl. 123—41.35 **9 Claims**



1. A liquid-cooled piston for reciprocal movement within a cylinder of an internal combustion engine comprising;

a generally cylindrical piston body having an outer peripheral surface with an annular groove defined in the outer peripheral surface;

a ring carrier assembly disposed in the annular groove and having at least one peripheral groove adapted to receive a sealing ring, the ring carrier assembly includes an annular metallic body having an axially extending inner peripheral

wall and a pair of upper and lower annular walls extend radially inwardly from the peripheral wall to form an inwardly facing, generally "C" shaped cross-sectional shape and enclosure means collectively defining a substantially closed, generally annular, integral coolant channel; and

means for providing communication with the coolant channel so that in use a coolant stream can be directed to the coolant channel.

4,907,546

AIR-COOLED TYPE COOLING SYSTEM FOR ENGINE WORKING MACHINE ASSEMBLY

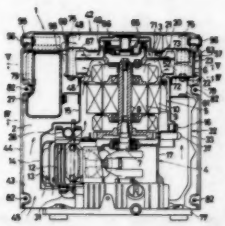
Akira Ishii; Koji Iwai; Ryoichi Ito, and Osamu Murakami, all of Sakaishi, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Nov. 21, 1988, Ser. No. 273,836

Claims priority, application Japan, Dec. 2, 1987, 62-306250; Dec. 2, 1987, 62-184798[U]; Dec. 9, 1987, 62-312506

Int. Cl.[4] F01P *1/00*

U.S. Cl. 123—41.56 **3 Claims**



1. In an air-cooled type cooling system for an engine working machine assembly including;

a casing, an air-cooled engine, a working machine, a centrifugal cooling fan, an exhaust muffler of the engine and a muffler cover thereof;

said casing comprising a machine area and a fan area partitioned therewithin,

said machine area comprising said engine, said working machine and said muffler cover, said exhaust muffler being accommodated within the muffler cover through a muffler cooling air passage; said fan area being provided with a centrifugal cooling fan;

a ventilation inlet in said machine area, an air suction opening in said fan area facing said machine area, an exhaust air outlet passage and an exhaust air conduction passage extending in parallel from the periphery of said fan room;

the outlet of said exhaust air outlet passage being in communication with the atmosphere, and the outlet of said exhaust air conduction passage being in communication with the muffler cooling air passage within the muffler cover.

4,907,547

ONE-PIECE WAVE DEFLECTOR FOR I.C. ENGINE INTAKE SYSTEM

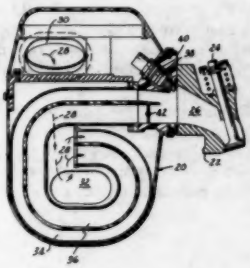
Paul D. Daly, Troy, Mich., assignor to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

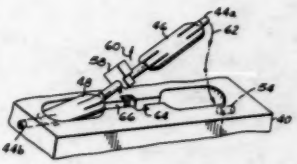
Filed Feb. 21, 1989, Ser. No. 313,645

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 M **29 Claims**

1. In an internal combustion engine comprising a pair of cylinders within which combustion takes place, an intake valve for each cylinder, a pair of runners for each cylinder through which air is conducted to the intake valve of the cylinder, a main air throttle mechanism disposed upstream of the runners for throttling the induction airflow into the cylinders, and a wave deflector mechanism disposed in a particular runner for one cylinder of said pair of cylinders and in a particular runner for the other cylinder of said pair of cylinders, said wave deflector mechanism being disposed just upstream of the intake valves of the two cylinders, said wave deflector mechanism comprising a rotary shaft that transversely spans both the particular runner for said one cylinder and the particular runner for the other cylinder and wave deflectors on and rotatable





with said shaft for selectively opening and closing the particular runner for said one cylinder and the particular runner for said other cylinder, the improvement characterized in that said wave deflectors and said shaft are integrally formed as a single part.

4,907,548

PINION GEAR ASSEMBLY FOR TRANSLATING RECIPROCATING MOVEMENTS OF THE PISTONS IN THE CYLINDERS OF AN INTERNAL COMBUSTION ENGINE INTO THE ROTATING MOVEMENT OF A SHAFT

Sangchin Lee, Bessarabienstrasse 4, D-7140 Ludwigsburg, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,479

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709790

Int. Cl.[4] F02B *75/32;* **G01B** *09/08*

U.S. Cl. 123—56 AC **2 Claims**

1. A pinion gear assembly for translating reciprocating movements of the pistons in the cylinders of an internal combustion engine into the rotating movement of a drive shaft of the engine, comprising:

two gear racks, each gear rack having at its two ends a piston connected thereto, each piston being associated with a cylinder of the engine;

a pair of shafts;

two pairs of gears;

a grip roller and expanding friction clutch assembly associated with each gear of said pairs of gears for mounting the associated gear to a respective shaft, each pair of gears being thus mounted to mesh with a respective one of the gear racks;

two further pairs of gears; and

a grip roller and expanding friction clutch assembly associated with each gear of said further pairs of gears for

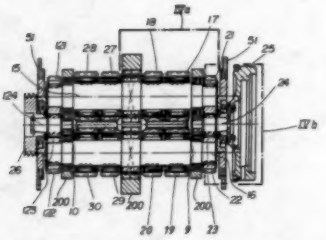
mounting the associated gear to a respective shaft, each further pair of gears being thus mounted to mesh with a respective one of the gear racks, such that:

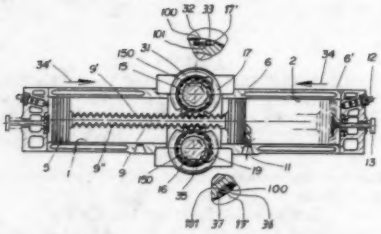
in one direction of movement of each gear rack one gear of each pair of gears drives its associated shaft in a given direction, and in the opposite direction of movement of each gear rack the other gear of each pair of gears drives said associated shaft in said given direction; and

said pair of shafts continuing to rotate in said given direction when each gear is rotated in a direction opposite to said given direction by its respective gear rack due to the grip roller and expanding friction clutch assembly associated with each gear;

said given direction being the same for each shaft which together serve to drive the drive shaft;

in said given direction, each shaft drives a gear of its associated further pair of gears and the gear rack meshing with said gear of its associated further pair of gears; and





in the direction opposite to said given direction, said gear of its associated further pair of gears free-wheels, and wherein:

each gear rack includes switching means, each grip roller and expanding friction clutch assembly includes: a grip roller bearing wheel fixedly mounted on its respective shaft, said grip roller bearing wheel having a plurality of recesses around its circumference each with a bottom surface, the distance of which from the inner surface of the gear wheel increasing in said given direction; a grip roller disposed in each recess; a spring in each recess for biasing the grip roller in its respective recess into a gripping position; a disc including a plurality of bars, one for each recess; and magnetic means for force-locking said disc, and each grip roller and expanding friction clutch assembly is switchable by said switching means.

4,907,549

SCAVENGING SYSTEM FOR A TWO-STROKE-CYCLE ENGINE

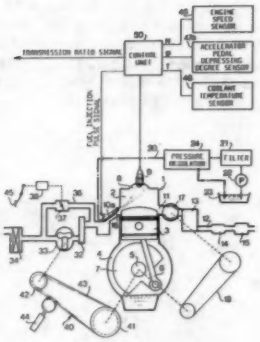
Koji Morikawa, Musashino, and Hideo Watanabe, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 341,148

Claims priority, application Japan, Apr. 30, 1988, 63-059601[U]; Apr. 30, 1988, 63-109500; Apr. 30, 1988, 63-109503; Apr. 30, 1988, 63-109504

Int. Cl.[4] F02B *33/00*

U.S. Cl. 123—65 BA **8 Claims**



1. A system for scavenging for a two-stroke engine having at least one cylinder, a scavenge port, an exhaust port, an intake passage communicated with said scavenge port, an exhaust passage communicated with said exhaust port, a fuel injector, and a scavenge pump provided in said intake passage, the system comprising:

a transmission ratio changing means operatively connecting said scavenge pump and a crankshaft of said engine for operating said scavenge pump;

an actuator for changing the transmission ratio of said transmission;

sensing means for detecting load on said engine and for producing a load signal; and

control means responsive to said load signal for operating said actuator so as to control increasing speed of said transmission ratio in accordance with the load.

4,907,550

APPARATUS FOR CHANGING OPERATION TIMING OF VALVES FOR INTERNAL COMBUSTION ENGINE

Kazuo Inoue, Tokyo, and Masaaki Katoh, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 107,977

Claims priority, application Japan, Oct. 23, 1986, 61-252625

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.16 **5 Claims**

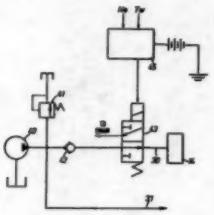
1. In a valve operation arrangement of an internal combustion engine including intake or exhaust valves normally urged by springs to close intake or exhaust ports of a combustion chamber; cam means rotated in synchronism with the engine crankshaft for operating said valves to open said ports; and a hydraulically operated valve operation timing changing device for varying the operation of said valves between a first condition and a second condition, said device comprising:

spring means for normally biasing said valve operation timing device in a mode for operating said valves in said first condition;

a fluid circuit operative to conduct operating fluid to said valve operation timing device in opposition to the bias of

said spring means, said hydraulic circuit including a hydraulic pressure generating means for producing a fluid pressure in said hydraulic circuit that varies directly with the rotational speed of said engine; and

said spring means having a spring force sufficient to place said valve operation timing device in a mode for operating



said valves in said first condition while said hydraulic pressure in said fluid circuit is in a range of fluid pressures below a predetermined level and in a mode for operating said valves in said second condition when the hydraulic pressure in said fluid circuit exceeds said predetermined level.

4,907,551

V-TYPE ENGINE

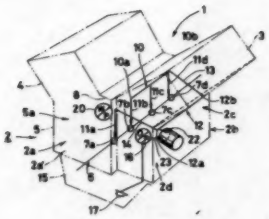
Takashi Sakono; Yasushi Inoue, and Shigeki Nakatani, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 28, 1989, Ser. No. 344,991

Claims priority, application Japan, Apr. 30, 1988, 63-108436; Jun. 15, 1988, 63-147566

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 R **19 Claims**



1. In a V-type engine in which a cylinder block comprises a left-hand bank and a right-hand bank, said left-hand and right-hand banks being arranged in a V-shaped form and having each a cylinder bore, and a crank chamber on which a lower end of each cylinder bore has opening; and in which a crank shaft mounted in said crank chamber is rotatably supported by plural crank journaling portions arranged in said cylinder block in a spaced relationship in an axial direction of the crank shaft; a V-type engine wherein:

said cylinder block includes a main oil gallery elongating in the axial direction of said crank shaft; a subordinate oil gallery elongating in said axial direction; a first feed passage feeding oil from said subordinate oil gallery to a predetermined crank journaling portion disposed at least on a side of one end portion of said cylinder block disposed in said axial direction, among said plural crank journaling portions, without passing through said main oil gallery; a second feed passage feeding a lubricating oil from said main oil gallery to said crank journaling portions other than said predetermined crank journaling portion; and a pump chamber having a rotary shaft disposed in parallel to said crank shaft;

a linkage passage interconnecting said main oil gallery to aid subordinate oil gallery;

said main oil gallery is disposed in a middle portion between said banks and at a position above said crank chamber, a top end of said main oil gallery being in a length elongating in said axial direction so as to fail to reach said predetermined crank journaling portion;

said subordinate oil gallery is disposed on one outward side portions of said banks; and

said pump chamber is disposed at one end portion of said cylinder block in said axial direction and on an imaginary line extending from said main oil gallery.

4,907,552

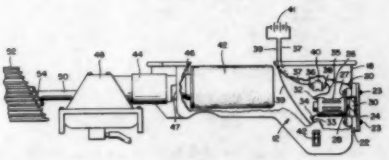
FORCED AIR INDUCTION SYSTEM

Chans A. Martin, Rte. 3, Box 125, Clovis, N. Mex. 88101

Filed Mar. 30, 1989, Ser. No. 330,760

Int. Cl.[4] F02B *77/00*

U.S. Cl. 123—198 E **8 Claims**



1. A forced air induction system comprising: an air box which is sealed except for two openings therein,

fan means secured in one of said two openings of said air box for sucking air into said air box through said one opening,

an air cleaner located within said air box and blocking the other of said two openings for filtering air sucked into said air box through said one opening by said fan means and pushed by said fan means through said air cleaner and out said other opening of said air box, and wherein an air-fuel mixer is located downstream from said air box in the flow path of air through said air box.

4,907,553

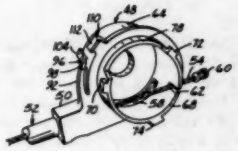
SPEED CONTROL CABLE ATTACHMENT

David L. Porter, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1988, Ser. No. 288,595

Int. Cl.[4] F02D *7/00*; B60K *31/06*; F16D *31/02*

U.S. Cl. 123—400 **14 Claims**



1. A cable attachment assembly for coupling a cable to a control system partially encased within a housing, comprising:

a cable drum rotatably coupled to said housing and positioned in alignment with an opening of said housing;

a protrusion of said housing adjacent said opening;

a cover having a substantially cylindrical casing adapted for coupling to said housing opening, said cable cover including a cable guide for guiding the cable therethrough to said drum; and

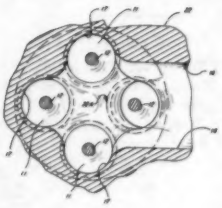
attachment means coupled to said casing for locking with said protrusion when said cable cover is rotated against said housing during an assembly process.

4,907,554

MULTIPLE INTAKE POPPET VALVE ARRAY FOR A SINGLE PORT

Charles W. Bergeron, 3841 Crawford Ave., Coconut Grove, Fla. 33133

Filed Jan. 23, 1989, Ser. No. 299,987
Int. Cl.[4] F02B *15/00*
U.S. Cl. 123—432 **8 Claims**



1. A multiple poppet valve array for use with a single intake duct in a four cycle internal combustion engine comprising:

three or more poppet valves;

an engine cylinder;

a cylinder head having at least one intake duct in fluid communication with said combustion chamber, said intake duct having three or more apertures opening into said engine cylinder, said apertures including poppet valve seats about their perimeter for seating said three or more poppet valves, the total aperture area substantially matching the cross sectional area of said single intake duct, sized as to complement the charge flow characteristics of said duct, the sum of the circumferences of the multiple valve bodies being greater than the duct circumference by a factor of 1.4 or more; and

means for opening and closing each of said poppet valves in communication with said poppet valves.

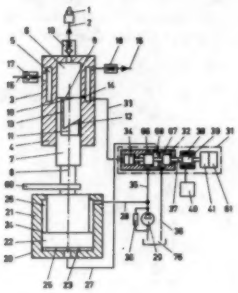
4,907,555

FUEL INJECTION DEVICE FOR A DIESEL ENGINE

Peter Fuchs, Adlikon, Switzerland, assignor to Nova-Werke AG, Effretikon, Switzerland

PCT No. PCT/CH87/00111, § 371 Date Jul. 8, 1988, § 102(e) Date Jul. 8, 1988, PCT Pub. No. WO88/02068, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 4, 1987, Ser. No. 207,047
Claims priority, application Switzerland, Sep. 9, 1986, 03616/86
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—446 **9 Claims**

1. A fuel injection device for a diesel engine, the fuel injection device having an injection nozzle connected through a pressure line to a fuel injector, the fuel injector having a body with at least one fuel line for the inflow and outflow of fuel, a pump chamber and a plunger, the plunger being connected with a drive unit acted on by fluid pressure to drive the plunger, with the distinction that the plunger (7) is rotatable around its longitudinal central axis (8) and has a groove (11) in its surface fluidly connected with the pump chamber (6), said groove (11) having a first helical control edge (12), a pressure source (29) independent of the fuel supply is fluidly connected to the drive unit (20), a first control device (31) is fluidly connected between said pressure source (29) and the drive unit (20), said first control device (31) being actuatable mechanically and electrically and having at least one main slide valve (32) fluidly separated of the fuel system, said first control device (31) being connected to the pump chamber (6) through a connection line (33) and by return piston (34) acted on by the injection pressure of the fuel, and at least one further control



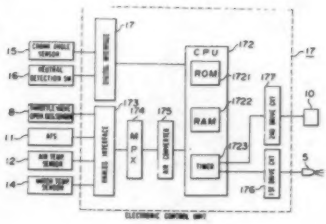
device located in a fuel line (15, 5, 16) is fluidly connected with the pump chamber (6).

4,907,556

ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shoso Ishii; Minoru Kuriyama, both of Hiroshima; Yukinobu Nishimura, and Setsuhiro Shimomura, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,281
Claims priority, application Japan, Oct. 14, 1987, 62-258763
Int. Cl.[4] F02D *41/00*
U.S. Cl. 123—486 **5 Claims**



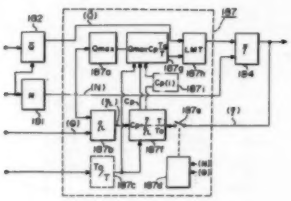
1. An electronic control system for internal combustion engine, in which parameters necessary for the engine control are found out by use of auxiliary quantities to thereby control the operating characteristic quantities of the internal combustion engine, said electronic control system comprising: memory means for storing in advance, in the form of a two-dimensional map, at least one parameter selected from the group comprising a charging efficiency per se and related values of the charging efficiency corresponding to a degree of opening of the throttle valve and a number of engine revolution under a reference atmospheric condition; and computing means for computing atmospheric pressure related values which include therein at least the atmospheric pressure value and are dependent on the atmospheric pressure, in accordance with a predetermined computation equation which takes a ratio of a parameter selected from the group comprising a charging efficiency per se and related values of the charging efficiency to be found out by selective use of signals of the intake air flow rate and a number of revolution of the internal combustion engine.

4,907,557

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shoso Ishii; Minoru Kuriyama, both of Hiroshima; Yukinobu Nishimura, and Setsuhiro Shimomura, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,021
Claims priority, application Japan, Oct. 14, 1987, 62-258762
Int. Cl.[4] F02D *41/04*
U.S. Cl. 123—488 11 Claims



1. A fuel injection system for internal combustion engine which comprises in combination: a fuel injection valve for supplying fuel to the internal combustion engine; air quantity measuring means for measuring a quantity of air passing through an air intake passageway of said internal combustion engine in both forward and backward directions; engine-revolution detecting means for detecting number of revolution of said internal combustion engine; condition detecting means for detecting each and every condition of said internal combustion engine; limiting means which is used when an output therefrom produces a time width of a pulse to be imparted to said fuel injection valve, and which is for limiting a variable related to the atmospheric pressure containing therein at least a quantity of air as measured by said air quantity measuring means with a limited value corresponding to the number of the engine-revolution; and atmospheric pressure conformed corrective value computing means, which stores therein reference values for said variables under predetermined atmospheric conditions with at least the number of engine-revolution as a parameter, and which computes the atmospheric pressure conformed corrective value during a predetermined operating condition by introducing thereinto an input signal corresponding to said parameter from said internal combustion engine condition detecting means and an output signal from at least one of said air quantity measuring means and said limiting means, said limiting means correcting said limited value in conformity to the atmospheric pressure by said atmospheric pressure conformed corrective value.

4,907,558

ENGINE CONTROL APPARATUS

Toshio Manaka, Katsuta, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,546
Claims priority, application Japan, May 15, 1987, 62-116834
Int. Cl.[4] F02D *41/10, 41/12, 41/14*
U.S. Cl. 123—489 12 Claims

1. An engine control apparatus for an internal combustion engine, comprising:

engine state detecting means for detecting states of said engine;

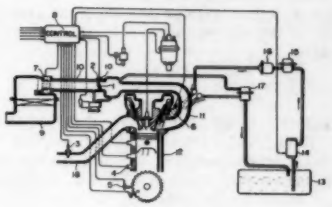
memory means for storing a fuel supply correcting value;

arithmetic means for determining arithmetically a fuel supply value on the basis of said engine state and said fuel supply correcting value;

first integrating means for integrating the fuel supply value;

second integrating means for integrating an intake air value;

updating means for updating said fuel supply correcting value on the basis of the output of said second first integrating means and the output of said second integrating means; and



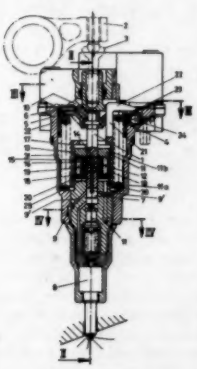
fuel supply means for controlling the fuel supply to said engine on the basis of said fuel supply value.

4,907,559

PUMP NOZZLE FOR DIESEL ENGINES

Heinz Rathmayr, Hallein, Austria, assignor to Voest-Alpine Automotive Gesellschaft m.b.H., Linz, Austria

Filed Apr. 3, 1989, Ser. No. 332,607
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811845
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—500 17 Claims



1. Pump nozzle for Diesel engines, in which an injection pump element comprising a pump piston (1) driven by a camshaft and a pump element bushing (11) is combined with an injection nozzle (8) to a unit to be associated to one motor cylinder each, wherein the pump piston (1) is surrounded by a control sleeve (12) being non-rotatable relative to the pump element bushing (11) and being adjustable in the direction of the axis of the pump piston (1) in dependence on operating parameters of the motor for the purpose of varying the beginning of injection and wherein the pump piston (1) can be rotated relative to the control sleeve (12) for the purpose of adjusting the supplied amount of fuel, characterized in that the control sleeve (12) is connected with a separating sleeve (17) surrounding the control sleeve and being non-rotatable and non-shiftable in axial direction relative to the control sleeve, said separating sleeve (17) being at both ends of the control sleeve (12) guided for being with its inner side axially shiftable on guiding surfaces (11*a*, 11*b*) of the pump element bushing (11), wherein the pump element bushing (11) includes a space (29) between the guiding surfaces (11*a*, 11*b*) for receiving the control sleeve (12), which space also forms the fuel discharge chamber, in that the separating sleeve (17) has at its end located

opposite the injection nozzle (8) a hook-like protrusion (21, 22, 33) sensing a surface (23, 34) transversely extending to the axis and being at least partially inclined relative to a plane normal to the axis of the pump piston (1) and being shiftable in parallel relation to said normal plane in the direction of its inclination, and in that an adjusting force provoking the axial adjusting movement of the control sleeve (12) acts on said inclined surface (23).

4,907,560

EXHAUST-GAS RECIRCULATING SYSTEM FOR INTERNAL-COMBUSTION ENGINES

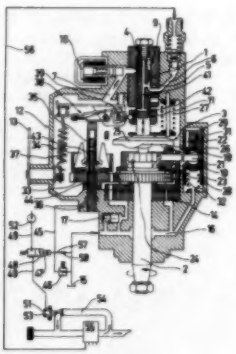
Klaus Krieger, Affalterbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,530

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740968

Int. Cl.[4] F02M *25/06*; F02D *21/08, 1/18*

U.S. Cl. 123—569 **7 Claims**



1. An exhaust gas recirculating system for an internal combustion engine having an air intake line and an exhaust gas line, said system comprising an exhaust gas recirculating line which connects said exhaust line to said intake line; an exhaust gas recirculating valve for controlling the passage of gas in said recirculating line in response to a control medium; a directional valve, provided with and acuated by a hydraulically actuated servomotor, for supplying said control medium to said recirculating valve; a fuel injection system for supplying fuel to the internal combustion engine, said fuel injection system providing a hydraulic control pressure for a range of engine characteristics including a minimum load and a minimum speed; and means for controlling said servomotor, and thereby said directional valve, in response to said hydraulic control pressure, said means for controlling the servomotor including means for directly applying the hydraulic control pressure to said servomotor.

4,907,561

IGNITION SYSTEM IN AN AIR-COOLED ENGINE

William C. Kandler, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

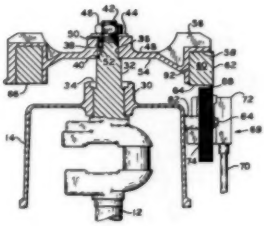
Filed Apr. 3, 1989, Ser. No. 332,745

Int. Cl.[4] F02P *1/08*

U.S. Cl. 123—599 **9 Claims**

1. In an internal combustion engine having a crankcase, a crankshaft disposed in said crankcase and extending outwardly therefrom, a cylinder extending from said crankcase along a radius of said crankshaft, a flywheel having a perimetric edge, said flywheel being coaxially connected to said crankshaft outwardly of said crankcase for rotation therewith in a plane perpendicular to said crankshaft, a permanent magnet affixed to said flywheel proximate the perimetric edge thereof and having a flat face exposed on a side of said flywheel facing toward said crankcase, said flat face being disposed in a plane perpendicular to said crankshaft, the improvement in combination therewith comprising:

a solid state ignition module attached to said crankcase externally thereof and having means for generating a high voltage ignition spark in response to and in synchrony with a changing magnetic field proximate thereto, said ignition module having a magnetic coil with a ferromagnetic core, said ferromagnetic core having a plurality of core legs extending in a direction toward said flywheel



generally parallel to said crankshaft and lying in a plane transverse to a radius of said crankshaft, said plane and said permanent magnet being located equally radially distant from said crankshaft, said core legs each having a flat end face disposed parallel to the flat face of said permanent magnet and periodically juxtaposed thereto as said permanent magnet passes said ignition module upon rotation of said flywheel, said flat end faces of said core legs and said flat face of said permanent magnet defining when juxtaposed a flat air gap therebetween, and means for providing adjustment in a direction parallel to said crankshaft of the position of the legs of said core with respect to said crankcase, whereby said air gap is adjustable.

4,907,562

METHOD FOR ACHIEVING AN ELEVATED CHARGE OF AN IGNITION CAPACITOR IN A CAPACITIVE TYPE IGNITION SYSTEM

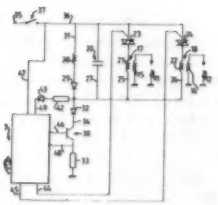
Hans Johansson, and Jan Nytomt, both of Amal, Sweden, assignors to Saab-Scania Aktiebolag, Sweden

Filed Nov. 18, 1988, Ser. No. 274,317

Claims priority, application Sweden, Nov. 24, 1987, 8704641

Int. Cl.[4] F02P *3/08*

U.S. Cl. 123—605 **13 Claims**



1. A method for achieving elevated charging of an ignition capacitor of a capacitive ignition system for internal combustion engines when starting the engine with the starting motor activated, in which the starting motor and ignition system are served by a common electrical system, characterized in that charging of the ignition capacitor is not commenced until a state in the engine working cycle is reached in which the

starting motor has its substantially lowest requirement of power from the electrical system of the engine, this state falling between two compression strokes in the engine working cycle where the instantaneous torque resistance of the engine is substantially at its lowest value.

4,907,563

HOUSING OF A DISTRIBUTOR INCLUDING AN IGNITION COIL FOR AN INTERNAL COMBUSTION ENGINE

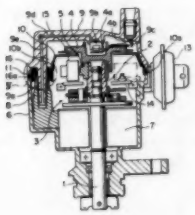
Seiki Kodama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,376

Claims priority, application Japan, Nov. 9, 1987, 62-170984

Int. Cl.[4] F01P *1/00*

U.S. Cl. 123—635 **4 Claims**



1. A housing structure of a distributor for an internal combustion engine including an ignition coil, comprising:

a cup-shaped housing base through which a shaft of the distributor rotatably extends, said cup-shaped housing base accommodating an ignition coil;

first high-voltage lead means connected to said ignition coil for leading high output voltage from a secondary winding of said ignition coil, said first high-voltage lead means including a hollow cylindrical member which extends in an axial direction of the distributor and has a central bore extending thereinto from a top end surface of said hollow cylindrical member;

a housing cap fitted onto said cup-shaped housing base and accommodating a high-voltage distributing portion of the distributor;

second high-voltage lead means fixed to said housing cap for leading high voltage supplied from said first high-voltage lead means to the high-voltage distributing portion of the distributor, said second high-voltage lead means including a solid cylindrical member which extends in the axial direction of the distributor and fits into said central bore in said hollow cylindrical member;

a partitioning member interposed between said housing base and said housing cap to separate the high-voltage distributing portion of the distributor, said partitioning member including a side extension which has a hole for allowing said cylindrical member of said first high-voltage lead means to extend therethrough; and

a first sealing member including a sealing portion tightly held between a top portion of said hollow cylindrical member of said first high-voltage lead means and said side extension of said partitioning member, and a sealing surface tightly pressed against an outer side surface of said solid cylindrical member of said second high-voltage lead means.

4,907,564

WIRE SAW

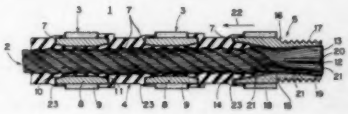
Nobuhiro Sowa, Kawachinagano, and Syuichiro Koroku, both of Fujieda, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe and Osaka Diamond Industrial Co., Sakai, both of, Japan

Filed Nov. 22, 1988, Ser. No. 274,489

Claims priority, application Japan, Nov. 24, 1987, 62-179269[U]; Apr. 12, 1988, 63-48887[U]; Apr. 12, 1988, 63-48888[U]

Int. Cl.[4] B28D *1/08*

U.S. Cl. 125—21 **12 Claims**



1. A wire saw comprising:

a wire rope;

a plurality of abrasive sleeves, each having opposite end surfaces and an outer peripheral surface and an inner peripheral surface, said outer peripheral surface having abrasive particles exposed thereon, said abrasive sleeves surrounding said wire rope and spaced at predetermined intervals longitudinally of said wire rope;

an elastic material of rubber surrounding said wire rope between said abrasive sleeves and between said inner peripheral surface of each of said abrasive sleeves and said wire rope; and

a rubber/metal bonding agent which effects vulcanization bonding between the opposite end surfaces of each of said abrasive sleeves and said elastic material, between said wire rope and said elastic material, between said inner peripheral surface of each of said abrasive sleeves and said elastic material, and between said wire rope and the portion of said elastic material surrounded by said inner peripheral surface.

4,907,565

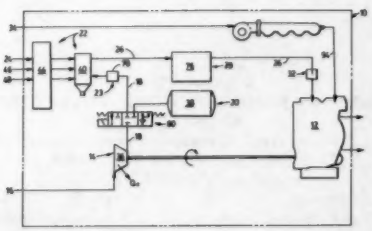
HIGH PRESSURE GASIFIER AND DIESEL CYCLE INTERNAL COMBUSTION ENGINE SYSTEM

John M. Bailey, Dunlap, and Abraham L. Zadoks, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Feb. 22, 1989, Ser. No. 313,694

Int. Cl.[4] F02B *45/00*

U.S. Cl. 123—23 **13 Claims**



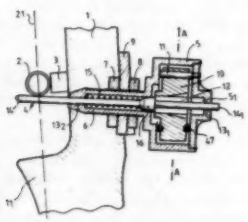
1. A method of operating a high pressure gasifier and engine system wherein said engine is a diesel-cycle internal combustion engine having an engine combustion chamber which, during an intake phase of the cycle, is adapted to admit therein a predetermined quantity of intake air, and which during a compression phase of the cycle and prior to a combustion phase, is adapted to compress the intake air to a predetermined maximum first pressure comprising the steps of:

(a) compressing air to form compressed air at a predetermined second pressure which is greater than said first pressure;
(b) gasifying a non-gaseous source of fossil fuel with said compressed air at about the second pressure and thereby producing gaseous fuel at about the second pressure; and
(c) injecting a predetermined quantity of said gaseous fuel at about the second pressure into said engine combustion chamber separately from said intake air during about a latter half of the compression phase of the diesel cycle.

4,907,566
RETRACTABLE ARROW-SUPPORT DEVICE FOR A BOW

Claude Klein, 40, rue Hémet, Aubervilliers (Seine Saint Denis), France

Filed May 9, 1989, Ser. No. 349,598
Claims priority, application France, May 11, 1988, 88 06375
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—41 A **14 Claims**



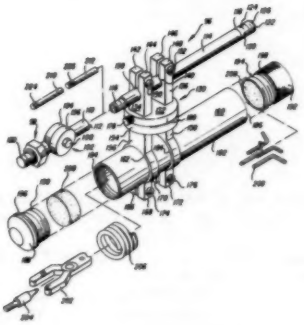
1. Retractable arrow-support device for a bow, this device being intended to be fixed on the shaft of a bow in the proximity of the area in which the arrow is held during its firing, this device comprising an arrow support movable under the action of a spring and a heavy weight movable in such a way as to be sensitive to the reaction forces produced by the bow upon firing of the arrow, this heavy weight constituting a lock for retaining the arrow support in the active position counter to the spring and for releasing it upon firing of the arrow in order to retract it, the device being characterized in that the arrow support (3, 4) consists of a rod (14, 30) mounted slideably under the action of this spring (15, 37).

4,907,567
ADJUSTABLE MULTI FUNCTION ROTARY BOW STABILIZER

Richard L. Henrich, 407 N. Harrison, Emmetsburg, Iowa 50536

Filed May 12, 1988, Ser. No. 193,504
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—89 **25 Claims**

1. A radially and axially positionable weight assembly to provide a bow stabilizer for a box comprising:
(a) a substantially cylindrical stabilizer shaft having a first end and a second end, said first end having means for removable attachment to a bow;
(b) an offsetting bracket means slidably mounted on said substantially cylindrical stabilizer shaft including locking means disposed on said bracket means for axially and radially locking and positioning said bracket means axially and radially along the length of said substantially cylindrical stabilizer shaft; and
(c) a stabilizing weight assembly attached to said bracket means disposed in a plane substantially parallel to said

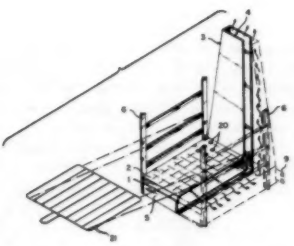


stabilizer shaft and axially and radially positionable with respect to said stabilizer shaft.

4,907,568
DOWNDRAFT BARBECUE

Thierry Pibernat, Graulhet, France, assignor to Adly Chamy, Toulouse, France

Filed May 20, 1988, Ser. No. 196,944
Claims priority, application France, May 22, 1987, 87 07292
Int. Cl.[4] A47J *27/58*
U.S. Cl. 126—25 R **18 Claims**



1. Portable or fixed barbeque of the type comprising a coal support, permeable to air, to carry the coal or equivalent to be burned, below which is disposed an exhaust chamber and above which is disposed a grill carrying food to be grilled, wherein attached to the coal support is an upper wall having two sides, one side facing the coal support and exposed to radiant heat from said coal support, and a second side forming an interior wall of a rising exhaust conduit, where the upper wall is thermally conductive such that during operation of the barbeque combustion air descends through the coal support due to suction in the exhaust chamber caused by heated air rising in the exhaust conduit.

4,907,569
WATER HEATER WITH SKIRT RING DAM

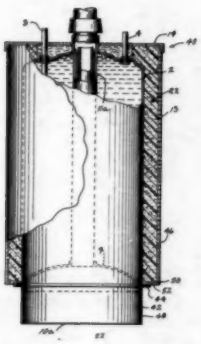
Rodney A. Lemense, Hartland, Wis., assignor to A.O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 5, 1989, Ser. No. 293,681
Int. Cl.[4] F24H *1/00*; B65D *25/18*
U.S. Cl. 126—373 **15 Claims**

1. An insulated fluid storage unit comprising:
an inner storage tank;
a lower skirt ring supporting and spacing said inner storage tank above a support surface, said skirt ring comprising a

sidewall extending upwardly from said support surface and a flange extending radially outwardly from said sidewall;

an outer jacket around said inner storage tank and spaced outwardly therefrom to define an annular space therebetween, said outer jacket having a lower end with a radially inwardly extending flange overlapping at least a portion of said radially outwardly extending flange of said skirt



ring and mating therewith to form a dam sealing said annular space;

foamed insulation introduced as a liquid into said annular space and hardening to form an annular insulation layer around said inner storage tank, said dam preventing leakage of said liquid therepast;

sealing means sealing the interface between said flanges, to provide further sealing of said dam in said annular space.

4,907,570

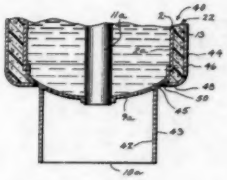
WATER HEATER WITH UPWARDLY SLIDING OUTER JACKET

Rodney A. Lemense, Hartland, Wis., assignor to A.O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 5, 1989, Ser. No. 293,683

Int. Cl.[4] A47J *27/00*; F24H *1/00*

U.S. Cl. 126—373 **14 Claims**



1. An insulated fluid storage unit comprising:

an inner storage tank;

a lower skirt ring supporting and spacing said inner storage tank above a support surface;

an outer jacket around said inner storage tank and having a main body portion spaced outwardly from said inner storage tank to define an annular space therebetween, said outer jacket having a lower end extending radially inwardly to mate with said inner storage tank at a point radially inwardly of said main body portion of said outer jacket and forming a dam sealing said annular space;

foamed insulation introduced as a liquid into said annular space and hardening to form an annular insulation layer around said inner storage tank, said dam preventing leakage of said liquid therepast,

wherein said outer jacket is inserted upwardly along said inner storage tank until said lower radially inwardly extending end mates with said inner storage tank,

and comprising sealing means sealing the interface between said inner storage tank and said lower radially inwardly extending end of said outer jacket,

wherein said sealing means comprises a gasket between said inner storage tank and said lower radially inwardly extending end of said outer jacket.

4,907,571

APPARATUS FOR THE PRACTICE OF AMBULATION

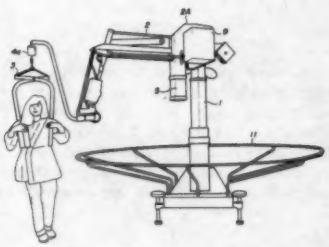
Kazuhiko Futakami, Shizuoka, Japan, assignor to Infutec Inc., Los Angeles, Calif.

Filed Feb. 26, 1988, Ser. No. 161,451

Claims priority, application Japan, Aug. 21, 1987, 62-209026; Aug. 28, 1987, 62-131105[U]; Nov. 13, 1987, 62-173265[U]; Feb. 17, 1988, 63-19810[U]; Feb. 19, 1988, 63-20800[U]

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—25 R **21 Claims**



1. An apparatus for the practice of ambulation, comprising:

means for suspending a patient by a predetermined suspension force;

means for producing said predetermined suspension force;

means for supporting said suspending means and conveying said predetermined suspension force thereto;

means for detecting a weight applied to said suspending means to produce a corresponding weight signal; and

means for controlling said suspension force producing means to produce thereby said predetermined suspension force related to said detected weight by receiving said weight signal from said detecting means, wherein said controlling means cooperates with said detecting means to limit an increase of said predetermined suspension force when said detected weight is increased by more than a predetermined rate.

4,907,572

VIBRATIONAL METHOD FOR ACCELERATING PASSAGE OF STONES FROM URETER

German Borodulin, San Francisco; Alexander Shkolnik, San Mateo; Maxim Persidsky, and Joachim W. Thüroff, both of San Francisco, all of Calif., assignors to Urological Instruments Research, Inc., San Francisco, Calif.

Continuation of Ser. No. 181,588, Apr. 14, 1988, abandoned, which is a division of Ser. No. 8,660, Jan. 30, 1987, Pat. No. 4,748,971. This application Apr. 18, 1989, Ser. No. 329,042

Int. Cl.[4] A61B *17/22*

U.S. Cl. 606—128 **18 Claims**

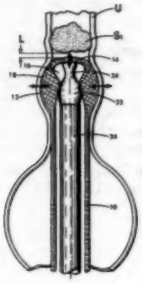
14. A method for removing a stone from a patient's ureter, comprising:

providing a catheter having a first end, a second end and a longitudinal axis, said first end having a tip and a substantially continous, circumferentially extending lateral surface;

inserting said catheter into the ureter of a patient such that

said first end is proximate a stone to be removed, said lateral surface being proximate to the inside wall of said ureter;

alternately radially expanding and contracting the entire lateral surface a first amount from said longitudinal axis in every direction simultaneously as viewed from a plane



substantially perpendicular to said longitudinal axis, said expansions and contractions being performed repeatedly in a single position in the ureter, said first amount being selected such that the radial movement of said lateral surface moves said inside wall of said ureter radially in every direction simultaneously as viewed from a plane substantially perpendicular to said longitudinal axis.

4,907,573

ULTRASONIC LITHOTRESIS APPARATUS

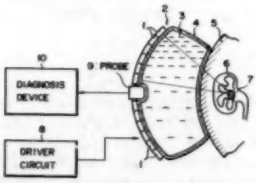
Tatsuo Nagasaki, Yokohama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 167,356

Claims priority, application Japan, Mar. 21, 1987, 62-67519; Apr. 17, 1987, 62-94973

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **5 Claims**



1. An ultrasonic lithotresis apparatus comprising:

shock wave generating means for generating ultrasonic shock waves and for converging the shock waves on a single point, said shock wave generating means including a plurality of piezoelectric elements arranged in a mosaic pattern, said piezoelectric elements having different resonance frequencies which increase stepwise in accordance with the distance between each piezoelectric element and the center of the piezoelectric elements arranged in said mosaic pattern; and

drive means for applying drive pulses to all of said piezoelectric elements of said shock wave generating means.

4,907,574

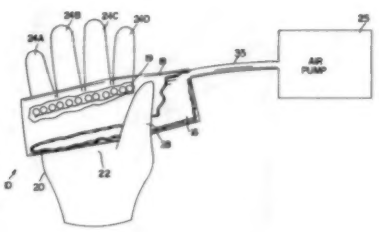
PROM EXERCISE DEVICE FOR OPPOSING CONTRACTURE

Thomas R. Hollerbach, 2716 Stevens Ave., South, Minneapolis, Minn. 55408

Filed Aug. 5, 1988, Ser. No. 229,335

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—64 **8 Claims**



1. A passive range of motion (PROM) device for manipulating hand muscles of a patient suffering from contracture, the PROM device comprising:

a glove for receiving the hand of a patient, with the glove having a thumb section and a plurality of finger sections joined to a hand section thereof;

an elastic sleeve secured to a palm side of the glove only at a point on each finger adjacent those areas on the fingers of the glove where the fingers join the hand section of the glove, and means to selectively close the sleeve to form a generally tubular enclosure; and

an inflatable bladder in the tubular enclosure defined by the sleeve, with the bladder being of a size sufficient to urge the fingers and thumb of the patient toward a straightened condition when inflated.

4,907,575

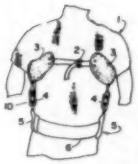
AMBULATORY LUMBAR TRACTION DEVICE

H. Sherwood Satterthwaite, 2005 Beechwood Rd., Hyattsville, Md. 20783

Filed Aug. 3, 1988, Ser. No. 227,549

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—75 **5 Claims**



1. An ambulatory traction device for eliminating or reducing the upper body weight on the lumbosacral area of a patient's spine, comprising:

an upper support member disposed to horizontally encircle a patient about an upper body region group of muscles;

a lower support member disposed for placement on the sides above a patient's hips; and

at least two turnbuckles extending vertically between said upper support and said lower suport having end rods permanently fixed to rigid innermost plates sandwiched inside of soft and pliable parts of the upper and lower support members; wherein said upper support member is fixed to elastic straps and is contoured to fit snugly about and adjacent to the Trapezius, Latissimus dorsi and Pecto-

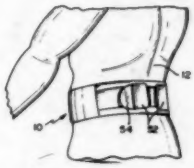
ralis major muscles when said straps are tightened about the upper body; and wherein foam rubber is adhesively bound over a part of said innermost plate, a canvas covering is bound over said foam rubber with a strap to hold said rubber in a prestressed state, tarpulin is the inside of an outer covering of said members, and soft leather is the outside.

4,907,576

ORTHOPAEDIC DEVICE USING NON-STRETCH MATERIAL AND METHOD FOR ITS MANUFACTURE

James D. Carlee, 1115 Lisburn Rd. - R.D. 3, Mechanicsburg, Pa. 17055

Filed Jan. 18, 1989, Ser. No. 298,423
Int. Cl.[4] A61F *5/02, 5/30*
U.S. Cl. 128—78 **16 Claims**



1. An orthopaedic belt for generating graduated pressure against the lumbar muscle groups comprising

an elastomeric section sized to encompass said muscle groups and having distal ends thereof,

a pair of non-stretch sections of generally rectangular configuration, each section having a first end and a second end, the first end of each section in securement to a distal end of the elastomeric section and the second end of each section sized to be at the front of the body but not meeting the other section's second end when the orthopaedic belt is placed around a portion of the body,

a pull strap means in selective securement to the second ends of the sections for urging the elastomeric section of the orthopaedic belt into tensioned engagement with the lumbar muscle groups,

a foamatitious layer of material interposed between the orthopaedic belt and adjacent body portions,

three dimensional pad means disposed between the foamatitious layer material and the elastomeric section,

the three dimensional pad means being contoured for developing and generating pressure against said lumbar muscle groups, and

the elastomeric section including at least one longitudinal seam for directing stress and strain functions of said pressure along the seam,

wherein a further non-stretch section is interposed between distal ends of the elastomeric section.

4,907,577

SPINAL TRANSPEDICLE DRILL JIG

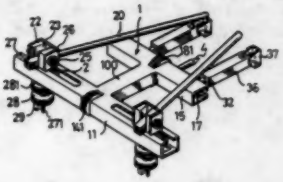
Shing-Sheng Wu, 2 Fl., No. 640-2, Ting Chow Rd., Taipei, Taiwan

Filed Apr. 3, 1989, Ser. No. 331,818
Int. Cl.[4] A16F *2/46*
U.S. Cl. 606—87 **12 Claims**

1. A spinal transpedicle drill jig comprising an I-shaped body, a pair of guiding bases and a pair of positioning bases;

said I-shaped body having a pair of front rails and a pair of rear rails; said rear rails and said front rails being respectively symmetrical about a central connecting portion; a first adjuster receiving means being provided between each said rear rail for receiving a first width adjuster; a second adjuster receiving means being provided between each said front rail for receiving a second width adjuster;

each said guiding base being slidable and securable in respective said rear rail and engageable with a respective sleeve means;



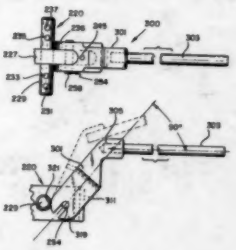
each said positioning base being slidable and securable in respective said front rail and engageable with a respective positioning arm.

4,907,578

METHOD AND INSTRUMENTS FOR RESECTION OF THE DISTAL FEMUR

Thomas D. Petersen, 555 Reservoir Dr., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 888,525, Jul. 23, 1986, Pat. No. 4,775,407. This application Sep. 22, 1988, Ser. No. 247,495
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] A61B *17/56*
U.S. Cl. 606—79 **32 Claims**



1. In a distal femoral resector for use in resecting the distal femur of a leg, said distal femur having a substantially flat surface formed on the anterior femoral cortex thereof, said resector comprising a base of substantially T-shaped configuration and adapted to be placed in overlying relation to said substantially flat surface, said substantially T-shaped configuration being defined by a proximal leg portion and a distal transverse portion, a rotating rod rotatably mounted through said leg portion and including means for attaching said base to said distal femur, said rod being rotatable to facilitate firm and flush attachment of said base to said substantially flat surface, an intercondylar notch pin attached to a distal side of said transverse portion; the improvement comprising:

(a) an attachment member on said proximal leg portion proximal of said rotating rod; and

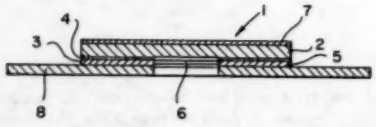
(b) means for aligning said resector removably attachable to said attachment member.

4,907,579

DISPOSABLE ADHESIVE BANDAGE

Kwang N. Kum, Sinkikun, Japan, assignor to Tsuneharu Noguchi, Fukuoka, Japan

Filed Jul. 12, 1988, Ser. No. 217,665
Claims priority, application Rep. of Korea, Feb. 8, 1988, 88-1460
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 5 Claims



1. A disposable adhesive bandage for stopping bleeding from an external wound of a human body which comprises:

a rigid base member,

an absorbent pad disposed on said rigid base member,

a rigid strip having an aperture disposed in the center thereof and a first adhesive and a second adhesive being coated on both surfaces thereof, said rigid strip being adhered to said absorbent pad by the first adhesive, and

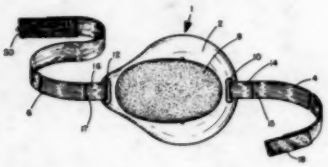
a protective backing sheet adhered to said rigid strip by the second adhesive whereby after the removal of the protective backing sheet, the bandage is directly attached to the human body over the external wound so that aperture is positioned directly over said external wound.

4,907,580

EYELID SPLINT WITH REPLACEABLE PAD

David Leonardi, 2320 Plaza del Grande, Las Vegas, Nev. 89102

Filed Oct. 24, 1988, Ser. No. 261,339
Int. Cl.[4] A61F *13/12*
U.S. Cl. 128—163 19 Claims



1. An apparatus for protecting an eye of a patient which comprises

an eye shield member having a smooth inner surface,

a soft resilient pad member removably secured to the smooth inner surface of the eye shield member,

said pad member having a rear surface adapted to press against the exterior of a patient's eyelid and a forward portion secured to the eye shield member, said pad member having a thickness sufficient to compress the patient's eyelid and maintain it in closed position when the apparatus is worn by the patient,

adhesive means disposed upon the forward portion of the pad member having a low-peel adhesion such that the pad member is easily removable from the eye shield member, and

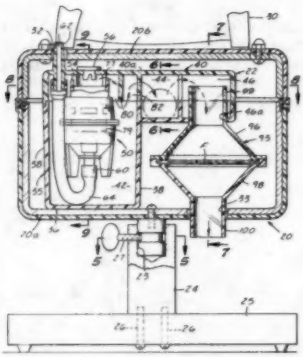
head-encircling strap means for attaching the apparatus to the head of a patient.

4,907,581

RADIOACTIVE AEROSOL INHALATION APPARATUS

Russell W. King, Sierra Madre, Calif., assignor to Medi-Nuclear Corporation, Inc., Baldwin Park, Calif.

Filed Jun. 30, 1988, Ser. No. 214,014
Int. Cl.[4] A61M *11/00*
U.S. Cl. 128—200.18 9 Claims



1. A radioactive aerosol inhalation apparatus comprising:

(a) lung aerosol apparatus including a housing having a first and second adjacently disposed chambers, said first chamber having interconnected side and bottom walls;

(b) nebulizing means including an upper collar and a lower liquid reservoir portion defined by the inner walls of an outer shell mounted laterally of said first chamber for nebulizing a fluid containing radioactive particles to produce a fine particulate laden spray having large and small radioactive particles, said nebulizing means having exhaust means for causing said particulate laden spray to flow toward said second chamber, said outer shell of said nebulizing means cooperating with said side and bottom walls of said first chamber to define a lower sump portion adapted to function as a settling chamber and separating said reservoir from said lower sump portion;

(c) a source of gas containing a gas under pressure and conduit means for conducting said gas to said nebulizing means;

(d) baffle means disposed intermediate said exhaust means of said nebulizing means and said second chamber for interaction with said particulate laden spray flowing toward said second chamber to impede the flow of large radioactive particles toward said second chamber, whereby said large radioactive particles will fall by force of gravity into said settling chamber for entrapment therein; and

(e) inhalation means in communication with said second chamber for permitting inhalation of spray reaching said second chamber.

4,907,582

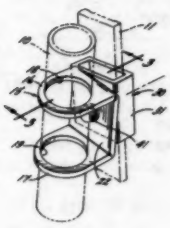
SWIVEL CLIP ATTACHMENT FOR DIVER BREATHING TUBE

Kurt E. Meyerrose, P.O. Box 832, Rutherfordton, N.C. 28139

Filed Apr. 24, 1989, Ser. No. 342,021
Int. Cl.[4] B63C *11/16*
U.S. Cl. 128—201.11 10 Claims

1. A swivel clip for removably attaching a diver breathing tube to the support strap of an underwater mask, wherein said breathing tube includes a free end and a mouthpiece on the opposite end, and wherein the support strap is adapted to extend around the head of the wearer and is connected at opposite ends to opposite sides of said mask, said swivel clip being of molded plastic construction and comprising

(a) a first part including a pair of spaced and parallel upper and lower legs having openings for encircling and elastically gripping medial portions of said breathing tube, and an intermediate leg member having upper and lower ends integrally molded with said upper and lower legs and extending in parallel relationship along one side of said breathing tube,



(b) a second part including an encircling housing through which the support strap of said mask passes to attach said encircling housing thereto, and

(c) means for removably interconnecting said intermediate leg member of said first part to said encircling housing of said second part, and for permitting swiveling movement of said first part relative to said second part.

4,907,583

DEVICE IN POWDER INHALATORS

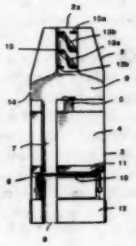
Kjell I. L. Wetterlin, S Sandby, Sweden; Risto Virtanen, Nurmijärvi, Finland, and Jan A. R. Andersson, S Sandby, Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

Continuation of Ser. No. 19,057, Feb. 26, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 287,611

Claims priority, application Sweden, Mar. 7, 1986, 86010600

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—203.15 **10 Claims**



1. In a powder inhalator for inhalation of an air flow generated at inhalation having a container containing a pharmacologically active compound in atomized or micronized form, a conduit extending through the container and having an air inlet, means for delivering a dose of the compound to the conduit, an outlet from the conduit for outflow of the compound in an air flow admitted at least partly through the air inlet, and a nozzle having a nozzle aperture and communicating with the conduit outlet, the conduit and nozzle together forming a channel for delivery of the compound upon inhalation, the improvement comprising deflector means in the channel for imparting a strong deflecting and accelerating movement to the flow of air and compound through the channel relative to the axis of the channel, wherein the deflector means are stationarily affixed in the channel along at least one section thereof between the dose delivery means and the nozzle aperture, the deflector means having at least a substantial radial extent towards the axis of the channel such that the radial extent of any open space along the axis of the channel adjacent the deflector means is small compared to the radial extents of the deflector means, the deflector means thereby acting to promote disintegration of powder aggregations into particles within the respirable range by causing collisions of such aggregations with the deflector means and with each other.

4,907,584

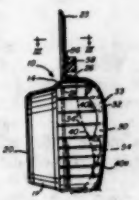
RESPIRATORY MASK

Gerald E. McGinnis, 131 Kelvington Dr., Monroeville, Pa. 15146

Filed Mar. 3, 1988, Ser. No. 163,562

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—206.24 **21 Claims**



13. The combination as claimed in claim **12** wherein said seal portion includes a radially inturned seal flap extending from said sidewall portion so as to present a generally annular sealing surface for confronting engagement with the face of such a user.

4,907,585

METHOD FOR IMPROVING FARSIGHTEDNESS

Ronald A. Schachar, P.O. Box 1039, Denison, Tex. 75020

Filed Dec. 3, 1987, Ser. No. 128,431

Int. Cl.[4] A61B *17/36*

U.S. Cl. 606—28 **7 Claims**

1. A method of changing the radius of curvature of a cornea comprising:

inserting an elongated member into a plurality of locations about the periphery of the cornea, and

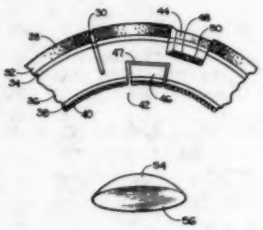
heating said elongated member to a temperature sufficient to degrade a plurality of elongate regions of corneal stroma, such that the limbus of the cornea is constricted to change the radius of curvature of the cornea.

4,907,586

METHOD FOR RESHAPING THE EYE

Josef F. Bille, Solana Beach, and Stuart I. Brown, La Jolla, both of Calif., assignors to Intelligent Surgical Lasers, San Diego, Calif.

Filed Mar. 31, 1988, Ser. No. 176,230
Int. Cl.[4] A61N *5/06*
U.S. Cl. 606—5 **69 Claims**



1. A method for modifying tissue with a quasi-continuous laser beam comprising an uninterrupted sequence of emissions each having a finite duration which comprises:

generating a beam of laser pulses, said beam comprising an uninterrupted sequence of at least one thousand pulses lasting for at least one second, wherein each of said pulses has less than 30 microjoules (30 uj) energy and is approximately one picosecond (1 psec) in duration;

establishing a start point in said tissue;

focusing said laser beam onto said start point;

selecting a volumetric power density for said laser beam; and

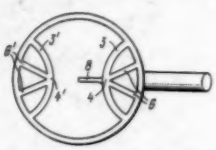
scanning said beam along a predetermined path in said tissue to modify said tissue along said path.

4,907,587

METHOD FOR SURGICAL CORRECTION OF MIXED AND HYPERMETROPIC ASTIGMATISM AND A DEVICE FOR CARRYING SAME INTO EFFECT

Svyatoslav N. Fedorov, ulitsa Dostoevskogo, 21, kv. 32; Albina I. Ivashina, utlitsa 800-letia Moskvy, 8, kv. 73; Valery B. Gudechko, ulitsa Ostrovityanova, 51, kv. 72; Olga G. Alexandrova, ulitsa 812 goda, 1, kv. 139, and Nadezhda K. Korshunova, 3 Mikhailovsky pereulok, 8, korpus 2, kv. 4, all of Moscow, U.S.S.R.

Filed Oct. 12, 1988, Ser. No. 256,503
Int. Cl.[4] A61B *19/00*
U.S. Cl. 606—28 **8 Claims**



1. A method for surgical correction of mixed and hypermetropic astigmatism, comprising:

(a) determining the position of the minimum refractive power meridian;

(b) carrying out thermocoagulation of two arcs having chords and circumferences of the same radius of curvature tangent to the distal points of the patient's eyeball central optic zone, which points lie on said minimum refractive power meridian and are arranged symmetrically with respect to an axis perpendicular to said meridian and passing through the optic center of the patient's eyeball, said thermocoagulation being performed first on said one of said two arcs, then on said other of said two arcs; and

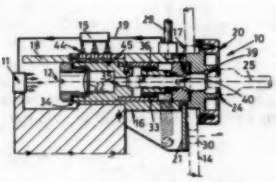
(c) carrying out thermocoagulation on both sides of two angles, the vertex of each of said angles being one of said distal points, while said minimum refractive power meridian serves as the bisector of said angles, the sides of each of said angles diverging in a direction away from the eyeball optic zone, and coagulation is first performed on the sides of one of said angles, then on the sides of the other of said angles.

4,907,588

LASER SYSTEM WITH LASER ACTUATION MEANS

Ronald J. Burston, 5 Auchengate, Barassie, Troon, Ayrshire, Scotland KA106V9

Filed Oct. 31, 1988, Ser. No. 264,417
Claims priority, application United Kingdom, Oct. 31, 1987, 8725566
Int. Cl.[4] A61B *17/36*
U.S. Cl. 606—11 **10 Claims**



1. A laser system having a housing containing a laser source capable of emitting a high energy parallel laser light beam along an optical axis, the laser source being controlled in operation by a controller and mounted on a rigid support, first socket means having a socket axis aligned with said optical axis mounted on said support extending between the laser source and an opening in said housing, second socket means replaceably secured in the first socket means, said second socket means being slidingly insertable and removable from within the first socket means through said housing opening and comprising a tubular main body portion containing a convergent lens aligned with the optical axis for focussing the parallel laser light beam whereby to form a laser radiation launch system the end of said main body portion adjacent said opening protruding therefrom and releasably receiving an optical fibre delivery system incorporating a single optical fibre having an end face which is critically positioned with respect to the convergent lens to receive focussed laser radiation, wherein said first socket means comprises switching means connected to said controller and said launch and delivery systems comprise actuating means arranged for selectively actuating said switching means when said launch and delivery systems are cooperatingly engaged with each other within the first socket means, said actuating means carrying coded information concerning the particular optical configuration of the launch system and which effects the selective actuation of the switching means.

4,907,589

AUTOMATIC OVER-TEMPERATURE CONTROL APPARATUS FOR A THERAPEUTIC HEATING DEVICE

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178

Filed Apr. 29, 1988, Ser. No. 188,272
Int. Cl.[4] A61B *17/36*
U.S. Cl. 606—34 **6 Claims**

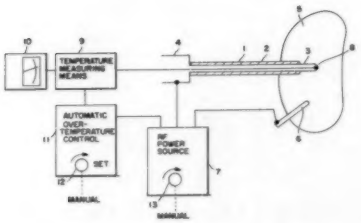
1. An apparatus for combined manual and automatic over-temperature control of heating of biological bodily tissue by an electrode applied thereto, said apparatus comprising:

(a) Electromagnetic power source means having a manually actuated output level control means for manually raising

or lowering the output power from said electromagnetic power source means applied to said electrode and thus raising and lowering the heating of said bodily tissue;

(b) Temperature measuring means adapted to be connected to said electrode, said electrode having a built-in temperature sensor such that said temperature measuring means detects the temperature sensed by said temperature sensor which in turn reflects the temperature of the tissue heated by said electrode;

(c) Over-temperature control means having means for manually setting a set-temperature, said over-temperature control means being cooperatively connected to said electromagnetic power source means and said temperature measuring means, whereby when the measured temperature,



which can be raised by said manually actuated output level control means, approaches said set-temperature, the over-temperature control means will regulate the output of said electromagnetic power source means to maintain said measured temperature within a range relative to said set-temperature;

so that an operator can manually control the rise of said measured temperature in the critical phase when said bodily tissue is beginning to be heated by said electrode by raising said manually actuated output level control means, and can also achieve stabilization of said measured temperature near said set-temperature when said manually actuated output level control means reaches an output level where said measured temperature approaches said set-temperature.

4,907,590

ACUPUNCTURE THERAPY BY BURYING SUTURES THROUGH AN ACUPUNCTURE NEEDLE

Li-Li Wang, and Hsieuh-Li Chin, both of No. 10, Lane 101, Chieng-Kuo First Rd., Kaohsiung City, Taiwan

Filed Jul. 25, 1988, Ser. No. 224,006
Int. Cl.[4] A61B *17/34*
U.S. Cl. 606—139 **2 Claims**

1. An acupuncture therapy comprising implanting a suture into a human body by using an acupuncture needle comprising a handle which is integrated with a suture holder and which is insertable into and engageable with the barrel portion of a needle barrel, a suture which is held integrally by said suture holder, a needle barrel which is constituted by a barrel integrated with a flange having a plurality of notches disposed thereon and a hollow needle disposed thereunder and through which said suture is insertable, a tube which has a plurality of projections, corresponding to said notches, disposed therein and which is engageable with said barrel and a cap which is engageable with one end of said tube to cover the needle and to prevent the needle from being contaminated, said barrel being slidable further into and through said tube when said projections match said notches, said suture which is inserted in the needle barrel having a small portion protruding outwardly from a tip of said needle;

the improvement which comprises:

said acupuncture therapy including the following steps:

A. Moving the acupuncture needle towards a location or area to be acupunctured and removing the cap from the tube;

B. Rotating the notches in said needle barrel to match said projections in said tube;

C. Depressing said handle to lower said neelde puncture the human body to a desired depth and then removing said tube;

D. Separating said handle from said needle barrel to expose a section of said suture between said handle and said needle barrel;

E. Cutting said section of said suture between said handle and said needle barrel and removing said handle;

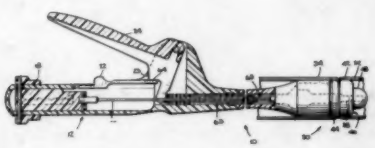
F. Withdrawing said needle from the human body to leave a small portion of said suture protruding beyond said tip of said needle to poke into a muscle in the human body for acupuncture treatment.

4,907,591

SURGICAL INSTRUMENT FOR ESTABLISHING COMPRESSION ANASTOMOSIS

Alfred V. Vasconcellos, Edison, N.J.; Ionel E. Teodorescu, Woodside, N.Y.; Joel W. Cummings, Hasbrouck Heights, N.J., and Dean E. McBeth, Groten-on-Hudson, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Mar. 29, 1988, Ser. No. 174,570
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—154 **31 Claims**



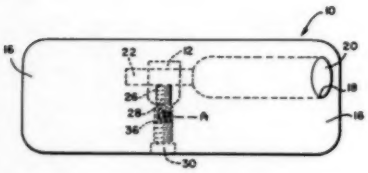
1. A device for installing a coupling assembly having a plurality of coupling members for compression anastomosis of a tubular structure comprising a body having a bore and including driver means and cutter means, means for imparting rotational movement to said cutter means, means for supporting the coupling members of said assembly, means for aligning said coupling members and means for driving said driver means for urging said coupling members into locking engagement and advancing and rotating said cutter means.

4,907,592

SELF-SEALING CONNECTOR FOR ELECTRICAL LEADS FOR USE IN WET ENVIRONMENTS

Clair Harper, Palm Coast, Fla., assignor to Cardiac Control Systems, Inc., Palm Coast, Fla.

Filed Dec. 12, 1988, Ser. No. 282,504
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—419 P 4 Claims



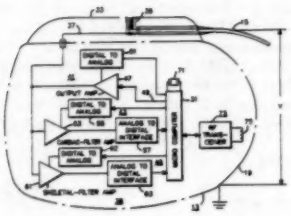
1. A connector system for an electrical lead of a body implantable device, comprising a connector block having an electrical connection to a sensor encased in a fluid-impervious material; a first opening in the connector block adapted to receive an electrical conductor; a second threaded opening in the connector block intersecting the first opening; a threaded set screw in said second opening; said set screw having an outer end and an inner end; a resilient screw plug closing the outer end of the second opening; said screw plug having an outer end of an inner end; and a viscous, fluid-impervious material between the outer end of the set screw and the inner end of the screw plug.

4,907,593

ADAPTATION OF HEART PACING TO PHYSICAL ACTIVITY

Charles M. Rapach, Clymer; David L. Purdy, Marion Center, both of Pa., and Orlando Maytin, Lauderdale Lakes, Fla., assignors to Biocontrol Technology, Inc., Indiana, Pa.

Filed May 21, 1987, Ser. No. 52,262
Int. Cl.[4] A61B 1/00; H05G 00/00
U.S. Cl. 128—419 PG 20 Claims



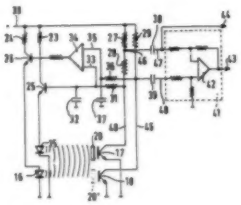
1. A heart pacemaker which in operation accommodates the physical activity of the host in whom said pacemaker is implanted; said pacemaker including pulse-generating means, means for conditioning said pulse-generating means to produce heart-stimulating pulses at predetermined intervals, means, connected to said conditioning means, for impressing said heart-stimulating pulses on the heart of the host, means connected to said conditioning means, for impressing on said conditioning means, myopotential pulses generated as a result of the physical activity of the host and means, responsive to said impressed myopotential pulses, for varying said predetermined intervals in dependence upon said physical activity to accommodate the length of said intervals to said physical activity.

4,907,594

METHOD FOR THE DETERMINATION OF THE SATURATION OF THE BLOOD OF A LIVING ORGANISM WITH OXYGEN AND ELECTRONIC CIRCUIT FOR PERFORMING THIS METHOD

Edwin Muz, Reutlingen, Fed. Rep. of Germany, assignor to Nicolay GmBH, Kirchheim, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 210,089
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723881
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—633 7 Claims



1. A method for the determination of the saturation of the blood of a living organism with oxygen, comprising the steps of:

simultaneously beaming into living tissue two separate beams of radiation in a first and in a second wavelength range, respectively, in which the absorption coefficients of oxyhemoglobin (HBO_2), on the one hand, and reduced hemoglobin (Hb), on the other hand, show different ratios for producing a mixed residual radiation emanating from the irradiated living tissue;

receiving from the mixed residual radiation

(i) residual radiation in the first wavelength range via a first optoelectronic receiver element, and

(ii) residual radiation in a larger measuring range, encompassing the first and the second wavelength ranges, via a second optoelectronic receiver element;

measuring the intensities of the two received residual radiations by means of photocurrents caused by said residual radiations in the respective receiver elements; and

subtracting a measured intensity of the residual radiation in the first wavelength range from a measured intensity of the residual radiation in the larger measuring range by an electronic circuit means for determining the intensity of the residual radiation of the second wavelength range.

4,907,595

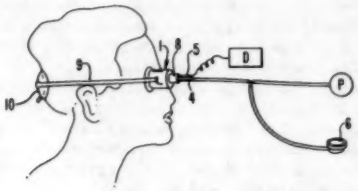
APPARATUS FOR SIMULTANEOUS DETERMINATION OF OPHTHALMIC ARTERY BLOOD PRESSURE AND FLOW

Andreas L. Strauss, Aggertalklinik, D-5250 Engelskirchen, Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 95,345
Claims priority, application France, Jan. 10, 1986, 86 00257
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—661.06 9 Claims

1. An apparatus for measurement of ophthalmic arterial blood pressure and flow which comprises (a) a rigid chamber means enclosed on all sides by walls except for an opening on one side for intimately contacting the orbital border or their neighbouring parts around the eye cavity; (b) means for increasing the pressure within said chamber means when the chamber means is applied on the orbital borders to the point where blood circulation through the ophthalmic artery ceases; (c) a manometer connected to said chamber means to permit

measurement of the pressure within said chamber means; and
(d) a Doppler probe means within the chamber means for



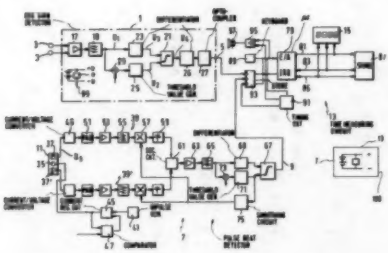
positioning on the periorbital ophthalmic branches to detect the point when blood flow ceases or reappears, respectively.

4,907,596

BLOOD PRESSURE MEASURING APPLIANCE

Walter Schmid, Fuchsweg 9, D-7914 Pfaffenhofen, and Bernhard Schwab, Buxheim, both of Fed. Rep. of Germany, assignors to Walter Schmid, Pfaffenhofen, Fed. Rep. of Germany

Filed Sep. 23, 1986, Ser. No. 910,487
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533912
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—672 **6 Claims**



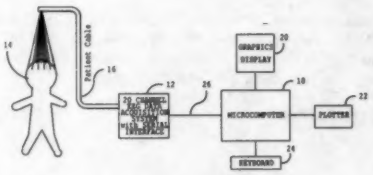
1. A blood pressure measuring appliance comprising:
(a) a pulse beat detector for detecting arterial pulse beats, the pulse beat detector comprising an active sensor having a measuring signal transmitter connected to an impulse generator having an impulse frequency selected to be equal to an integral multiple greater than or equal to twice a line voltage frequency, delivering a measuring signal of impulse form and two measuring signal receivers spaced from one another and from the measuring signal transmitter, which respond to the measuring signal in dependence upon the pulse beat, and wherein the measuring signal receivers are coupled to a selector circuit which is responsive to signal amplitudes of the received measuring signals;
(b) an ECG signal detector having at least two ECG electrodes for determination of ECG signals, and an evaluation circuit selectively responding to ECG signal peaks of a predetermined type and amplifying the ECG signals of the ECG electrodes, the ECG electrodes being contactable to skin;
(c) a time measuring means for determination of time intervals between a predetermined ECG signal peak acquired by the ECG signal detector and the pulse beats acquired by the pulse beat detector, respectively, following the predetermined peak, the selector circuit delivering the received measuring signal having a greater of the signal amplitudes in each case for controlling said time measuring means;
(d) a blood pressure display means for displaying the duration of time interval determined by the time measuring means as blood pressure information;
(e) a signal transmission arrangement optically coupling the evaluation circuit of the ECG signal detector with the time measuring means;
(f) a first operational voltage source supplying exclusively the ECG signal detector including the optical signal transmission arrangement; and
(g) a second operational voltage source supplying the remaining components of the blood pressure measuring appliance independent of the first operational voltage source.

4,907,597

CEREBRAL BIOPOTENTIAL ANALYSIS SYSTEM AND METHOD

Nassib G. Chamoun, Roxbury, Mass., assignor to Biometrak Corporation, Cambridge, Mass.

Filed Oct. 9, 1987, Ser. No. 107,357
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—731 **28 Claims**



1. A method of noninvasively detecting cerebral irregularities that effect cerebral electrical activity, said method comprising the steps of:
acquiring electroencephalographic signals from a surface of a region of the head of a subject being analyzed through a surface electrode;
dividing said acquired signals into segments and representing said segments as data records;
computing bispectral values for all data records of said acquired signals;
utilizing said bispectral values to generate single number indices to quantify a contribution to overall cerebral electrophysiologic stability provided by the region to which said surface electrode is connected.

4,907,598

GUILLOTINE BIOPSY NEEDLE PROVIDED WITH FLEXIBLE STYLUS AND CANNULA

Alberto Bauer, Via Del fosso 1, Pieve Di Cento, Italy

Filed Apr. 19, 1988, Ser. No. 183,613
Claims priority, application Italy, May 5, 1987, 21519/ 87[U]
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—753 **2 Claims**

1. A biopsy guillotine needle, characterized in that said needle comprises a guillotine portion therewithin a drawing member (7) is able of longitudinally sliding, said drawing mem-

ber having a cutting edge at its distal end for entering tissue to be sampled and being rigid with the free end of a flexible cable

(4) controlled for sliding within a flexible sheath (5) by control means (2) acting on the opposite end of said flexible cable.

4,907,599

SOFT TISSUE CORE BIOPSY INSTRUMENT

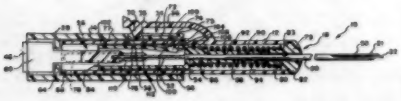
Glenn N. Taylor, Longmont, Colo., assignor to Hart Enterprises, Inc., Wyoming, Mich.

Continuation-in-part of Ser. No. 150,984, Feb. 1, 1988, Pat. No. 4,821,551. This application Aug. 15, 1988, Ser. No. 231,907

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—754 **13 Claims**



1. A soft tissue core biopsy instrument comprising:

a proximal outer barrel member having a distal end and a proximal end;

a distal inner barrel member which is slidably received within said outer barrel member and which has a distal end and a proximal end;

a cannula driver in said inner barrel member;

a cannula extending distally from said inner barrel member, being fixed to said cannula driver, and having a distal tip, said cannula driver being slidably received and movable within said distal inner barrel member and said cannula extending a predetermined distance out of said distal end of said inner barrel member when the instrument is in an at rest condition;

a stylet having a distal end, a distal end portion, a proximal end, and being removably received in said outer barrel, in said inner barrel, and in said cannula, said distal end portion having a biopsy sample receiving notch therein;

a stylet hub mounted to said proximal end of said stylet, said stylet hub being removably attached to the proximal end of said proximal outer barrel member to enable multiple biopsies to be obtained with one insertion of said cannula, said stylet extending distally from said hub and within said cannula with said distal end portion (a) being positioned within said cannula when the instrument is in an at rest position and (b) extending distally of said distal tip of said cannula in position to capture a biopsy sample when the instrument is in a cocked position;

biasing means within said inner barrel member for biasing said cannula driver toward the distal end of said inner barrel member;

latching means associated with said cannula driver and said inner barrel member for latching said cannula driver in a proximally retracted cocked position within said outer barrel member and said inner barrel member against the biasing action of said biasing means;

a trigger, associated with said latching means, for unlatching said latching means, said trigger, upon being actuated for unlatching of said latching means, allowing said biasing means to quickly return said cannula driver and said cannula to said at rest distally extending position thereof and over said stylet distal end portion.

4,907,600

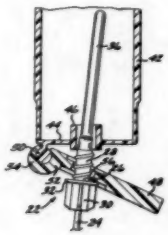
BLOOD COLLECTOR CYLINDER WITH NEEDLE EJECTOR

Treesa A. Spencer, 21882 Winnebago, El Toro, Calif. 92630

Continuation-in-part of Ser. No. 43,884, Apr. 29, 1987, abandoned. This application Jul. 21, 1988, Ser. No. 222,151

Int. Cl.[4] A61B *5/14*

U.S. Cl. 128—764 **8 Claims**



1. A cylinder and needle assembly ejector used for collecting blood samples in conjunction with a blood sample collector tube and with a needle assembly, the collector tube adapted to fit at least partially within the hollow interior of the cylinder, the collector tube being sealed at one of its ends by a septum pierceable with a needle, and the needle assembly having an intermediate portion which is dimensioned to fit and be mounted in an apertured sleeve formed in an end wall of the hollow cylinder, a first hollow needle portion extending axially outwardly from the hollow cylinder, and a second hollow needle portion extending axially inwardly into the interior of the cylinder, the first and second hollow needle portions being in fluid communication with one another, the first hollow needle portion being adapted to pierce a person's veins, and the second hollow needle portion being adapted to pierce the septum, the cylinder and needle assembly ejector comprising:

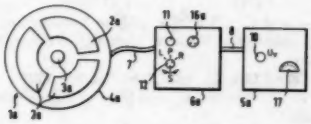
manually actuable means mounted to the cylinder for ejecting the needle assembly from engagement with the hollow cylinder, the means for ejecting capable of operating without the needle assembly being touched by human hands, whereby after use, the needle assembly can be discarded while touching of the same by human hands is avoided, the sleeve of the cylinder comprising a plurality of split segments, and the manually actuable means further comprising means for engaging the split segments of the sleeve for forming a firm internal aperture wherein the needle assembly is mountable.

4,907,601

ELECTROTHERAPY ARRANGEMENT

Kuno Frick, Balzers, Liechtenstein, assignor to Etama AG, Liechtenstein

Filed Sep. 29, 1988, Ser. No. 250,639
Claims priority, application European Pat. Off., Jun. 15, 1988, 88109558.2
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—783 25 Claims



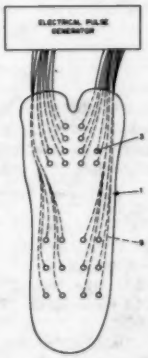
1. An electrotherapy arrangement comprising: a current source; a switching means connected thereto; a carrier bearing an electrode array adapted to be connected to the switching means, the electrode array including at least first, second and third outer electrode portions constituting a pole of the array and arranged substantially in a circle and an inner electrode portion constituting the other pole of the electrode array and arranged substantially at the center of the circle, the switching means being operable to apply voltage to the outer electrode portions with one polarity alternately with a given frequency of switching-over from one said electrode portion to another while the inner electrode portion carries the other polarity; and means for varying the voltage of the current source and the switching-over frequency of the switching means.

4,907,602

DEVICE FOR CONTROLLING THE GLOTTIC OPENING

Ira Sanders, New York, N.Y., assignor to The Mount Sinai School of Medicine of the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 788,748, Oct. 18, 1985, abandoned. This application Apr. 24, 1987, Ser. No. 42,440
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—787 4 Claims



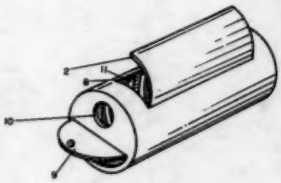
1. A device for the controllably stimulating the glottic opening of an animal comprising a soft indwelling platform having a first and second surface, which platform conforms to the hypopharynx and proximal esophagus, the first surface fitting over and in contact with the laryngeal and anterior esophageal mucosa, a plurality of electrodes attached to and spaced over the first surface of the platform, and leads attached to each of the electrodes, said leads being attachable to means for generating and applying an electrical current to the leads.

4,907,603

SAFETY SMOKE

Thomas E. Chambers, Gainesville, Ga., assignor to Bertha D. Chambers, Gainesville, Ga.

Filed Jan. 4, 1988, Ser. No. 115,833
Int. Cl.[4] A24F *13/16*
U.S. Cl. 131—175 1 Claim



1. A cigar or cigarette holder having a mouthend and a lighting end comprising a cylindrical housing having an internal diameter of such size so as to accommodate a cigar or cigarette; said housing on its cylindrical surface having an access of such size so that a cigar or cigarette can be inserted into said housing; said access having a first door fitted therein and hinged to said housing; said first door permits access into said housing when in an open position or closes off the interior of said housing from the outside of said housing when in a closed position; an array of vent holes provided adjacent to said access on said surface so as to allow for the exchange of smoke and ambient air; a clip provided on said housing so as to allow said housing to be attached to a pocket on a users apparel; said mouthend having a socket adapted to fit a mouthpiece; a mouthpiece fitted in said socket; said mouthpiece providing fluid communication between the interior of the housing and the exterior of said housing; said lighting end having a first and second opening; said first opening communicating with the interior of said housing and adapted for lighting the cigar or cigarette in said housing or for accommodating a lighter; said second opening, adjacent said first opening, adapted to allow for the removal of ashes in said housing; said second opening having a second door fitted therein and hinged to said housing; said second door adapted to facilitate the removal of ashes when in an opened position and to retain ashes in said housing when in a closed position; a grill rack provided on the interior walls of the cylindrical housing so as to support a cigar or cigarette and allow ashes to fall freely from the cigar or cigarette.

4,907,604

DEVICE FOR EXTINGUISHING AND SAVING CIGARS

Arthur L. Beloff, Milford, Conn., assignor to Cigar Savor, Inc., Hamden, Conn.

Continuation-in-part of Ser. No. 42,050, Apr. 24, 1987, Pat. No. 4,777,968. This application Apr. 25, 1988, Ser. No. 185,848
Int. Cl.[4] A24F *15/08, 15/18*
U.S. Cl. 131—256 14 Claims

1. A device for rapidly extinguishing a lighted cigar and for saving said extinguished cigar for later consumption which comprises:

a hollow cylindrical tube having a closed end portion and an open end portion opposed thereto;

a first removable cap adapted to fit within said open end portion for sealing the open end so as to form a substantially airtight container and thereby promote rapid extinguishment of said lighted cigar;

said cap having a bore configured to receive to receive and reshape an unlit end of a cigar; and

a pin mounted to said cap for punching a hole in said unlit end of said cigar, said pin being centrally located within said bore.

4,907,605

ORAL TABACCO SUBSTITUTE

Jon P. Ray, and Michael P. Ellis, both of San Antonio, Tex., assignors to Advanced Tobacco Products, Inc., San Antonio, Tex.

Continuation of Ser. No. 771,246, Aug. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 738,120, May 24, 1985, abandoned. This application Jan. 25, 1989, Ser. No. 303,036

Int. Cl.[4] A24B *47/00*

U.S. Cl. 131;270 **4 Claims**

1. An oral nicotine dispenser comprising: nicotine and a water insoluble polymeric substance formed of numerous strips sorptively containing the nicotine and slowly releasing nicotine when said oral nicotine dispenser is in an oral environment.

4,907,606

TOBACCO COMPOSITIONS, METHOD AND DEVICE FOR RELEASING ESSENTIALLY PURE NICOTINE

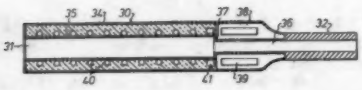
Jan E. Lilja, Kristianstad, and Sven E. L. Nilsson, Helsingborg, both of Sweden, assignors to AB Leo, Helsingborg, Sweden

Division of Ser. No. 882,929, Jun. 19, 1986, Pat. No. 4,776,353. This application Jan. 26, 1988, Ser. No. 148,701

Claims priority, application Sweden, Nov. 1, 1984, 8405479

Int. Cl.[4] A24D *1/00*; A24F *1/00*

U.S. Cl. 131—273 **9 Claims**



1. Device for the release and administration of nicotine in gaseous form, comprising receiving means (**10, 30**) which has a receiving space (**11, 31**) provided therein with an inlet and an outlet (**12, 36**) and in which a matrix containing the nicotine is insertable, and a mouthpiece (**19, 32**) communicating with the outlet (**12, 36**) of said receiving space, characterized by a heating element (**14; 40; 48, 49, 50**) associated with said receiving space (**11, 31**), said heating element being adapted to produce heat in said space (**11, 31**), said heating element itself or subsidiary temperature control means (**17; 41**) being selected or provided for restricting the temperature in the receiving space (**11, 31**) to a predetermined value below the combustion temperature of the matrix, said device being completely self-contained and having no external electrical connection, characterized in that the heating element (**40**) consists of a heating coil connectible to a battery (**39**) contained therein and disposed in a wall defining the receiving space (**31**).

4,907,607

PROCESS AND DEVICE FOR TESTING CIGARETTES OR THE LIKE FOR FAULTS

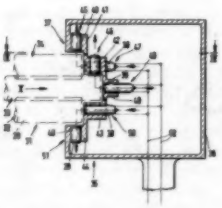
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Company, Verden, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,717

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243204

Int. Cl.[4] A24C *5/34, 5/32*

U.S. Cl. 131—280 **14 Claims**



1. A testing device for testing the tobacco content of a cigarette comprising:

a light source means for directing light to the cigarette under test;

light receiver means for receiving the light from said light source means which enters said cigarette, is transmitted through at least a portion of said cigarette, and exits said cigarette from other than the points where the light enters the cigarette;

test head means for receiving the cigarette under test such that light from said light source means is directed to an end face of said cigarette, said test head means including light receiver retaining means for locating and retaining said light receiver means at an angle to the longitudinal axis of said cigarette;

said light receiver means including a plurality of light receivers and said test head means including means for receiving a plurality of cigarettes to receive light from said light source means and for holding a plurality of light receivers.

4,907,608

PROCESS AND APPARATUS FOR TESTING CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 37,272

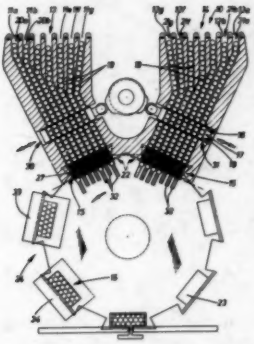
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613090

Int. Cl.[4] B07C *5/34*; B65B *19/30*

U.S. Cl. 131—282 **9 Claims**

1. Process for testing cigarettes and separating out defective cigarettes, the test being conducted in the region of magazine shafts of a cigarette magazine by a test unit which can be advanced to the ends of the cigarettes, and defective cigarettes being separated out in succession, whereas intact cigarettes are pushed out in cigarette groups at the bottom end of the magazine shafts in a main pushing-out plane, each group containing

plural layers of cigarettes, said process comprising the steps of conveying defective cigarettes (29) beyond the main pushing-



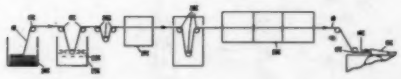
out plane (22) into a secohd region below the latter, and separated out the defective cigarettes in said second region.

4,907,609

METHOD OF INCREASING THE HARDNESS OF CIGARETTE FILTER ELEMENTS

Richmond R. Cohen, Hockessin, and Jimmie D. McCarty, Arden, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 24, 1988, Ser. No. 236,477
Int. Cl.[4] A24D *3/08, 3/10, 3/12*
U.S. Cl. 131—332 **25 Claims**



1. A method for increasing hardness of cigarette filter elements obtained from substrate in the form of at least one of an open fiber tow, a sliver, a ribbon of nonwoven material, and fibrillated film, comprising

(A) contacting polyolefin-containing substrate with effective amounts of (a) a water soluble resin component having available chelate bond-forming chemical groups and (b) a nontoxic metal salt of an element selected from the group consisting of zinc, magnesium aluminum, sodium, calcium and potassium; said resin component forming a chelate bond with chelate bond-forming groups of said water soluble resin component; and

(B) completing fabrication of the desired filter element.

4,907,610

CLEANING SYSTEM FOR SWIMMING POOLS AND THE LIKE

Jonathan E. Meincke, Columbia, S.C., assignor to Crystal Pools, Inc., Irmo, S.C.

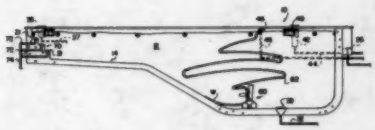
Continuation-in-part of Ser. No. 897,122, Aug. 15, 1986, Pat. No. 4,828,626. This application May 8, 1989, Ser. No. 348,957
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—56 R **23 Claims**

1. An improved cleaning system for a swimming pool or the like in which a water circulation system is employed including at least one suction water line connected between said pool and a water pump, a filter system connected to said pump and at least one water return line connected between said filter and said pool, comprising:

(a) further filter means associated with a suction water line connected to the suction side of said pump for filtering at least large debris from water passing therethrough;

(b) a mobile cleaning unit connected to said suction water line having said filter means associated therewith and being operable on water being sucked through said line to move about said pool and perform a cleaning function;

(c) at least one cleaning water line connected between a discharge side of said pump and said pool;



(d) at least one stationary cleaning unit connected to said at least one cleaning return line at said pool; and

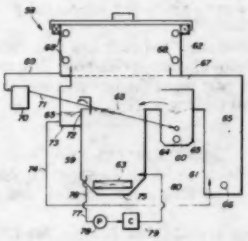
(e) control means included in said circulation system for diverting water flow through said mobile cleaning unit and through said at least one cleaning return line during predetermined times for instituting operation of said cleaning units and consequent cleaning of said pool.

4,907,611

ULTRASONIC WASHING APPARATUS

Yoshihide Shibano, Aikoh, Japan, assignor to S & C Co., Ltd., Aikoh, Japan

Filed Dec. 9, 1987, Ser. No. 130,552
Claims priority, application Japan, Dec. 22, 1986, 197207[U]; Mar. 9, 1987, 53543; Jul. 23, 1987, 184568
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—60 **5 Claims**



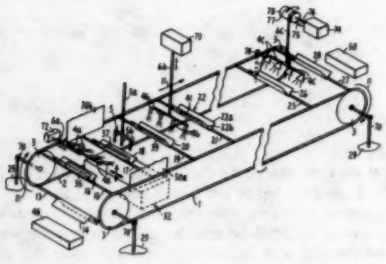
1. Ultrasonic washing apparatus comprising at least one washing vessel at a single or multi-washing stages, each containing a washing liquid for washing an object to be cleaned when thrown into the washing vessel, an ultrasonic vibrator for radiating ultrasonic waves into the washing liquid and an oscillator for operating the ultrasonic vibrator characterized in that it further comprises degassing means for removing gas from the washing liquid, thereby enhancing cavitation in the washing liquid when the ultrasonic waves are radiated in the washing liquid, said degassing means comprising a boiling vessel which is put upstream of the washing vessel on the washing liquid supplying side, said boiling vessel being effective in removing from the washing liquid a gas whose boiling point is lower than the boiling point of the washing liquid.

4,907,612

UNIVERSAL MATERIAL HANDLING APPARATUS

Boris Levit, Cupertino, and Michael A. C. Millerick, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 28, 1988, Ser. No. 263,724
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—72 36 Claims



1. An apparatus for handling a substantially planar first part, the first part having a first surface and a second surface opposite said first surface, including:

(a) a first drive chain oriented in a first plane;

(b) a second drive chain oriented in a second plane substantially parallel to the first plane;

(c) a first rigid member, having a first end attached to the first drive chain and a second end attached to the second drive chain;

(d) a first carrier attached to the first rigid member and dimensioned to receive the first part, the first carrier being V-shaped and having a leading side and a trailing side attached to a leading side so that when the first surface of the first part is contiguous with the leading side the trailing side acts as a stop against which the first part may be flipped thereby upwardly exposing the first surface of said first part, wherein the first drive chain and the second drive chain may be rotated simultaneously so as to translate the first rigid member, the first carrier, and the first part along a carrier path in a substantially vertical plane; and

(e) a first nozzle array disposed at a first station along the carrier path, for directing at least one jet at the first carrier and the first part when the first part and the first carrier translate past the first station.

4,907,613

CONTACT LENS CLEANING DEVICE

Edgar M. Litzaw, 50 Tiburon St., Bay 14, San Rafael, Calif. 94901

Filed Sep. 12, 1988, Ser. No. 243,471
Int. Cl.[4] B08B 3/04
U.S. Cl. 134—158 4 Claims

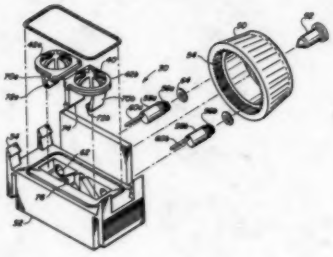
1. A contact lens cleaning device comprising:

a housing member bearing an internal cavity for containing a cleaning solution;

a lens holder portion for releasable capture of said contact lens, said lens holder portion terminating in end portions separated by a first distance, said lens holder portion conditioned for reciprocating motion within said housing member;

connecting rod means attached to said lens holder portion, said connecting rod means comprising a pair of connecting rods each attached to only one of said lens holder end portions; and

rotary drive means connected to said connecting rod means, said rotary drive means comprising a pair of crankshafts each bearing an off-center crankpin, said crankpins attached to said connecting rods so that said crankpins are separated by a second distance lens than said first distance,



so that rotation of said rotary drive means moves said lens holder portion in reciprocating motion.

4,907,614

CARRYING ATTACHMENTS FOR UMBRELLAS

Peter Stamm, Leichlingen, Fed. Rep. of Germany, assignor to Kortenbach Verwaltungs-und Beteiligungung Sggesellschaft mbH & Co., Soligen, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,358
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807537
Int. Cl.[4] A45B 9/02
U.S. Cl. 135—20 R 9 Claims

1. In an umbrella frame including an elongated stick having a longitudinal axis and first and second ends, a handle on said first end and a crown on said second end, at least one of said handle or crown having an eyelet extending transversely through opposite sides of an intermediate portion of said at least one of said handle or crown and at a right angle to the longitudinal axis of said stick, a flexible and manually-and-tensionally deformable carrying member threaded through said eyelet and being slidable in said eyelet and substantially filling the cross section of said eyelet when said crarying member is relaxes and in a non-tensionally-deformed condition, said at least one of said handle or crown through which said eyelet extends having a combination threading-slot-and-clamping channel comprising a pair of spaced wall portions each having a respective inner, abrupt transverse edge originating at said eyelet and extending parallel the entire extent of said eyelet, said walls extending radially from said eyelet the entire length of said eyelet and continuing radially into the outer surface of said at least one of said handle or crown and forming a transverse open slot at the outer surface of said at least one of said

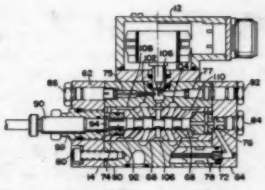
handle or crown, said abrupt transverse inner edges of said walls being spaced a wisth substantially less than a cross section of said eyelet and the cross section of said carrying member in its relaxed condition but permitting passage of said carrying member when the carrying member is tensionally deformed to a reduced cross section for permitting the deformed carrying member to be drawn manually past said abrupt inner edges, along the spaced walls, and through the slot in the outer surface of said/one of said handle or crown and away from the stick of said umbrella frame.

4,907,615

HIGH FREQUENCY RESPONSE SERVOVALVE WITH ELECTRICAL POSITION FEEDBACK ELEMENT STRUCTURE AND METHOD

Endre A. Meyer, Birmingham, and Robert D. Kachman, Troy, both of Mich., assignors to Schenck Pegasus Corporation, Troy, Mich.

Filed Nov. 5, 1987, Ser. No. 116,912
Int. Cl.[4] F15B *13/43*
U.S. Cl. 137—1 **26 Claims**



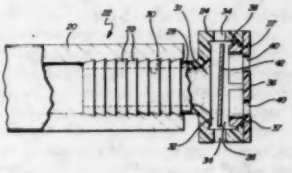
1. A high frequency response electrohydraulic servovalve including a first stage, high response force motor, a second stage, pilot valve, and a third stage, metering valve connected in series so that the force motor controls the pilot valve and the pilot valve controls the metering valve, means for providing a first electrical signal representing a demand flow through the third stage metering valve, a first differential amplifier, a second differential amplifier and a third amplifier in series between the means for providing the first electrical signal and the force motor for passing the first signal, modified in the differential amplifiers to the force motor, said second stage; pilot valve including a metering spool movable and unbiased axially to control fluid flow therethrough in accordance with the electrical signal passed to the force motor, a non contacting, electromagnetic, proximity type sensor positioned adjacent one end of the metering spool to sense eddy currents on axial movement of the spool and to convert them into a second electrical signal representative of the position of the spool in the pilot valve for providing a feedback signal to the second differential amplifier for altering the first electrical signal modified in the first differential amplifier in accordance with the position of the metering spool, a valve member in the third stage, metering valve, a linear voltage differential transformer positioned on the metering valve of the electrohydraulic servovalve for providing an electrical signal representative of the position of the valve member of the third stage of the electrohydraulic servovalve and means for passing the electrical signal representative of the position of the valve member of the third stage of the electrohydraulic servovalve to the first differential amplifier for modifying the first electrical signal as it is passed through the first differential amplifier in accordance with the position of the valve member of the third stage of the electrohydraulic servovalve.

4,907,616

CHECK VALVE ASSEMBLY

Rudolph Bergsma, Ann Arbor, Mich., assignor to G.T. Products, Inc., Ann Arbor, Mich.

Filed Aug. 15, 1988, Ser. No. 232,002
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—38 **15 Claims**



1. For use in a fuel return line which terminates in a fuel storage tank; a check valve for preventing reverse flow from the tank through the return line comprising:

a valve body having a hollow interior valve chamber bounded by a side wall, an axial inlet passage opening into the chamber and a valve seat around the passage opening;

first port means formed in the body opposite the inlet and having an axial flow direction relative to the chamber;

second port means formed in the valve body side wall for flow between the chamber and the tank volume external of said valve body and having a transverse flow direction relative to the chamber; and

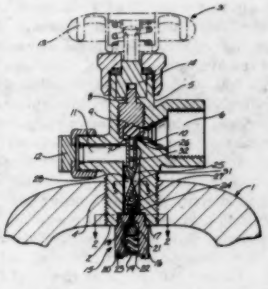
a valve plate disposed within the chamber between the inlet and the first port means; the plate being freely axially movable between a closed position on the valve seat and an open position spaced from the seat; the valve plate in the open position permitting substantially unrestricted flow of fuel from the inlet to and through the second port means via the chamber but substantially blocking flow of fuel from the inlet to and through the first port means via the chamber; said plate being positioned in said open position relative to said second port means such that reverse fuel flow from the tank to said inlet via said chamber draws said plate to said seat to close said valve.

4,907,617

SAFETY VALVE FOR A COMPRESSION GAS CYLINDER

Paul S. Whalen, St. Rte. Box 411, Placitas, N. Mex. 87043

Filed Nov. 9, 1988, Ser. No. 269,170
Int. Cl.[4] F16K *17/40*
U.S. Cl. 137—71 **30 Claims**



1. A safety valve for a compression gas cylinder to shut-off gas flow at the tank port of the cylinder when downstream gas

flow control apparatus is structurally disrupted by external forces, comprising:

(a) a housing having a conduit therethrough for the passage of gas where said housing is adapted for fitting into said tank port,

(b) a poppet seat located in said conduit and in a fixed position relative to said tank port,

(c) a poppet passing through said poppet seat adapted to close said conduit when said poppet bears against said poppet seat,

(d) bias means for biasing said poppet to bear against said poppet seat whereby said conduit is normally closed,

(e) frangible set-off means compressively disposed between said poppet and said gas control apparatus responsive to bending and shear stress transmitted to said frangible set-off means by said gas control apparatus for holding said poppet off said poppet seat such that upon sufficient external force acting upon said gas control apparatus said frangible set-off means will break before said gas control apparatus thereby closing said conduit and preventing further gas flow.

4,907,618

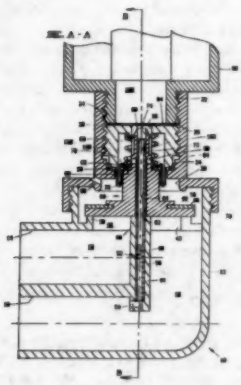
DISPENSER FOR IRRIGATION CHEMICALS

I-Chung Ho, 6958 Grovespring Dr., Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 215,741, Jul. 6, 1988. This application Feb. 21, 1989, Ser. No. 313,616

Int. Cl.[4] A01C *23/00*

U.S. Cl. 137—268 **18 Claims**



1. A dispenser for irrigation chemicals comprising: a housing defining an inlet, an outlet, and a first flow path extending between said inlet and said outlet for communicating a flow of irrigating water therebetween, said housing defining bore means opening from said first flow path outwardly thereon for sealingly and removably receiving a chambered cartridge of irrigation chemical, which cartridge includes a penetrable diaphragm sealingly closing said cartridge chamber within said housing bore means, a plunger member reciprocably received in said bore means and movable between a first position spaced from the diaphragm of said cartridge and closing said first flow path and a second position bounding said first flow path and penetrating said diaphragm, said housing and said plunger member cooperating in said second position of the latter to define both a second flow path for water flow from said first flow path to the chamber of said cartridge and a third flow path for flow of water and irrigation chemical from said cartridge chamber to said first flow path, said plunger member including moving means for in response to said flow of irrigating water in said first flow path moving forcefully from said first position to said second position to penetrate said diaphragm member.

4,907,619

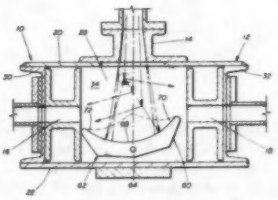
FLOW PROPORTIONER APPARATUS

Jerome I. Paulson, Lancaster, Pa., assignor to Delta Conveying Inc., Audubon, Pa.

Filed Jun. 15, 1988, Ser. No. 207,174

Int. Cl.[4] F16K *11/02*

U.S. Cl. 137—875 **16 Claims**



1. A flow proportioning device for proportioning the flow of fluent solids from an inlet to between two outlets, said device comprising:

a generally square housing defining a central chamber having an inlet in a top wall and a pair of axially aligned outlets in two opposite side walls, said outlet openings being symmetric with respect to said inlet opening;

deflection means mounted on a bottom wall of said chamber opposite said inlet and between said outlets, said deflection means being pivotally mounted for rotary movement about an axis transverse to the axis of alignment of said outlets and forming a target surface, said deflection means comprising a deflection member having an upper striking surface with a substantially central hemispherical recess flanked by a pair of diverging flanges extending generally parallel to each other and transverse to the axis of alignment of said outlet ports, said flanges lying closely adjacent respective outlet ports; and

means to adjustably position said deflection means whereby material falling from said inlet and striking said deflection member will be rebounded and proportionally deflected toward said outlets.

4,907,620

PROPORTIONER PUMPING SYSTEM

Richard W. Becker, Casper, Wyo., assignor to Becker Enterprises, Casper, Wyo.

Filed Sep. 13, 1988, Ser. No. 243,814

Int. Cl.[4] F16K *19/00*

U.S. Cl. 137—893 **17 Claims**

1. A pumping system for pumping a first fluid and selectively adding a second fluid to said first fluid, said pumping system comprising:

(a) a source of said first fluid;

(b) a source of said second fluid;

(c) a pump having inlet and outlet ports;

(d) an inlet conduit communicating between said source of first fluid and said inlet port of said pump;

(e) a discharge manifold including an inlet opening and at least one discharge opening;

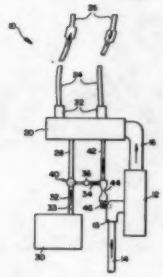
(f) an eductor conduit having first and second ends; wherein said first end is operatively connected to said discharge manifold and said second end is operatively connected to said inlet conduit;

(g) a feed conduit connected between said source of second fluid and said eductor conduit;

(h) a control valve contained in said feed conduit;

(i) a flush conduit connected between said discharge manifold and said control valve;

wherein said control valve is movable between a first position in which said second source of fluid is operatively connected to said feed conduit and a second position in which said flush conduit is operatively connected to said feed conduit; wherein when said control valve is in said first position said second fluid is drawn through said feed conduit and into said pump as said first fluid moves through said pump, and when said control valve is in said second position a portion of said first fluid moves through said flush line and into said feed conduit.



4,907,621

BLADDER-TYPE ACCUMULATOR WITH MOVABLE CUP-SHAPED SENSOR

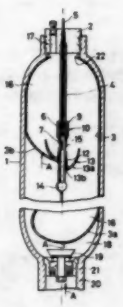
Nobuyuki Sugimura, and Kazuo Sugimura, both of 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Nov. 17, 1988, Ser. No. 272,410

Claims priority, application Japan, Mar. 4, 1988, 63-029064[U]; Apr. 28, 1988, 63-106989

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—30 **11 Claims**



1. A bladder-type accumulator with a movable cup-shaped sensor and a bladder, comprising: a vessel body having a plug; a guide provided on said plug in such a manner as to project into a bladder; a switch selectively positionable along said guide; a cup-shaped sensor movable along said guide in accordance with the deformation of said bladder; and a switch actuation element movable with said cup-shaped sensor.

4,907,622

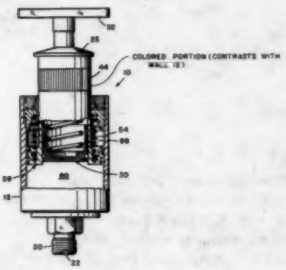
FLUID RESERVOIR DEVICE

Daniel T. Meisenheimer, Jr., Orange, and David T. Ho, West Haven, both of Conn., assignors to Spectrum Associates, Inc., Milford, Conn.

Continuation of Ser. No. 71,913, Jul. 10, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,423

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—31 **8 Claims**



1. A fluid reservoir and pressure protection device for connection to and use with a pressurized fluid system, comprising:

(A) a housing having a bottom wall, a mounting shank defining a fluid inlet opening through the bottom wall and a cylindrical chamber wall, at least the interior of said cylindrical chamber wall being anodized;

(B) a first piston slideably received in the cylindrical chamber wall and spring biased downwardly therein, said first piston having an upturned skirt carrying at least one piston ring fabricated of a hard, lubricious polymer which interfaces with the anodized cylindrical chamber wall, said first piston also having a piston stem defining an opening which extends through the first piston[3 s working surface, the exterior of the piston stem being anodized;

(C) an annular support ring extending from the upper portion of the cylindrical chamber wall and having a continuous cylindrical surface closely surrounding the piston stem, said cylindrical surface defining at least one annular groove carrying a piston stem guide ring fabricated of a rigid lubricious polymer, which interfaces with the anodized surface of the piston stem;

(D) an annular scraper mounted above the annular support ring, said annular scraper having a cylindrical surface closely continuously surrounding the stem of the first piston and a bevelled top surface oriented to scrape and disperse foreign matter therefrom or the piston stem travels downwardly; and

(E) a second piston slideably received in the stem of the first piston, and spring biased downwardly therein, said first and second pistons defining a variable volume chamber in fluid and pressure communication with the pressurized fluid system, whereby fluid in the fluid reservoir and pressure protection device provides a reservoir for the pressurized fluid system and fluid from the system may be forced into the fluid reservoir and pressure protection device to alleviate pressure in the fluid system.

4,907,623

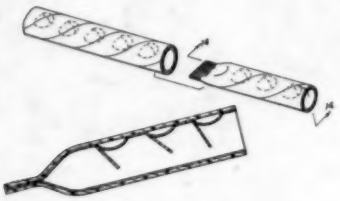
HEAT-SHRINKABLE INSULATING TUBE

Douglas S. Kinney, Easton, Md., and Clark M. Kinney, Jr., Washington, D.C., assignors to Plastics Tubes Company, Easton, Md.

Continuation of Ser. No. 904,032, Sep. 5, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 204,915

Int. Cl.[4] B65D 59/06; H02G 15/02

U.S. Cl. 138—108 10 Claims



1. An insulating connector comprising:

a. a heat shrinkable tube comprising a spiral laminate formed of plural ribbons of heat recoverable plastic material, said tube having an inner surface; and

b. said tube including a plurality of tab members formed of portions of said spiral laminate bent inwardly from remaining portions of said spiral laminate and extending unitarily inwardly from said inner surface of said tube for physically engaging wires or the like over which said tube can be fitted to mechanically retain said tube thereon until permanent retention thereon can be effected by subsequent heat shrinkage of said tube over such wires or the like.

4,907,624

THERMOSETTING RESIN PIPE

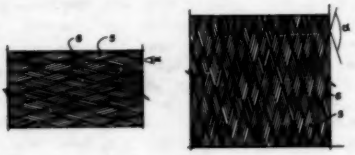
Vollmar Jonasson, Lycksele, Sweden, assignor to Inpipe Aktiebolag, Vilhelmina, Sweden

Continuation of Ser. No. 715,760, Mar. 25, 1985, abandoned, which is a continuation of Ser. No. 294,779, Aug. 20, 1981, abandoned, which is a continuation of Ser. No. 168,398, Jul. 10, 1980, abandoned, which is a continuation of Ser. No. 931,010, Aug. 4, 1978, abandoned. This application Apr. 3, 1986, Ser. No. 847,106

Claims priority, application Sweden, Jul. 7, 1978, 7808229

Int. Cl.[4] F16L 9/14

U.S. Cl. 138—125 11 Claims



1. A pipe of thermosetting resin, characterized in that it comprises a layer of curable thermosetting resin enclosed between a hose-shaped inner foil and a hose-shaped outer foil, which layer in its curable state together with said two foils forms the shape of a flexible foldable hose, in which shape the pipe is intended to be applied or laid in the place in question and after its application or laying is given its final shape and is made shape permanent by curing the thermosetting resin.

4,907,625

REFREGERANT TRANSPORTING HOSE

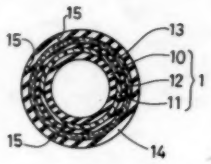
Hiroaki Ito, and Koji Akiyoshi, both of Inuyama, Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Dec. 21, 1988, Ser. No. 287,150

Claims priority, application Japan, Dec. 28, 1987, 62-333601; Dec. 28, 1987, 62-333600

Int. Cl.[4] F16L 11/08

U.S. Cl. 138—126 9 Claims



1. A refrigerant transporting hose comprising:

an inner tube;

an outer tube of a rubber material located radially outwardly of said inner tube, said outer tube having a thickness of 1 to 2.5 mm; and

a reinforcing fiber layer interposed between said inner and outer tubes, such that said reinforcing fiber layer is adhesively bonded to the inner and outer tubes to constitute an integral tubular body,

said inner tube including a resinous layer formed of a blend of modified polyolefin and polyamide resin, said modified polyolefin being selected from the group consisting of (i) a copolymer of olefin monomer and comonomer selected from ethylenically unsaturated carboxylic acid and its derivative, (ii) graft copolymer of polyolefin and graft monomer selected from ethylenically unsaturated carboxylic acid and its derivative, and (iii) reaction product of polyolefin and reaction agent selected from carboxylic acid and its derivative, said copolymer, graft copolymer or reaction product having 0.1 to 20% by mole of said comonomer, graft monomer or reaction agent, respectively, a ratio by weight of said modified polyolefin to said polyamide resin being within a range of 30/70 to 70/30, said resinous layer having a thickness of 0.1 to 2.5 mm,

said inner tube further including an innermost layer of a rubber material located radially inwardly of said resinous layer, said innermost layer and said resinous layer being adhesively bonded to each other, said innermost layer having a thickness of 0.3 to 1 mm.

4,907,626

WRAPPED BUSH HAVING IDENTICAL JOINT PORTIONS IN ENDS JOINED AT JOINT

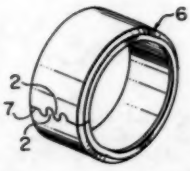
Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed May 25, 1988, Ser. No. 202,571

Claims priority, application Japan, Jun. 2, 1987, 62-138682

Int. Cl.[4] F16L 57/00

U.S. Cl. 138—156 5 Claims



1. A bush formed of a piece of plate which has been cut out

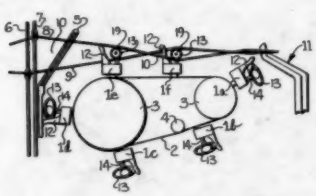
from a band-shaped plate for bushes wrapped to a cylindrical form and having first and second ends jointed at a joint, said ends having facing edges which are substantially perpendicular to the plane of the plate, each of said first and second ends having at least one pair of joining elements consisting of a recess and a projection of the same size and configuration, said joining elements of said first end being of the same configuration and of the same size as those of said second end but being formed at positions shifted axially so that said joining elements of said first and second ends are arranged in such a manner that, when said ends of said bush are joined at said joint, a pair of said joining elements formed in one of said ends is complementary and interfits with the pair of said joining elements formed in the other of said ends, each joining element having a radius of curvature R extending from a centerpoint whereby 2R is greater that the distance between adjacent centerpoints so that said joining elements interlock with one another.

4,907,627

WEFT GUIDE AND SHED RETAINER FOR A FLUID JET LOOM

Thomas F. McGinley, Clearwater, Fla., assignor to Picanol NV, Polenlaan, Belgium

Filed Oct. 27, 1988, Ser. No. 263,268
Int. Cl.[4] D03D *47/00*
U.S. Cl. 139—11 **5 Claims**



1. In a weft guide and shed retainer for a multiple shed, fluid jet weaving machine, including multiple weft guide and shed retainer elements arranged to engage and to maintain a plurality of sheds between warp threads and to move so as to advance said shed toward the cloth fell during weaving, each of said weft guide and shed retainer elements including a normally open slotted tubular section arranged to receive, guide and release a weft thread inserted into the tubular section and transported therethrough by weft insertion fluid during weaving, each of said weft guide and shed retainer elements being arranged to be movable between a weft thread receiving and guiding position and a weft thread releasing position, and to cooperate with adjacent weft guide and shed retainer elements extending in a weftwise direction when in its weft receiving and guiding position for forming a substantially continuous weft guide bore through each shed area, the improvement comprising:

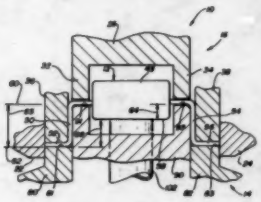
each of said weft guide and shed retainer elements including upstream and downstream ends relative to the insertion jet stream, said ends including sealing surfaces including axially and radially extending portions arranged to cooperate and mate with adjacent mating sealing surfaces on adjacent weft guide and shed retainer elements so as to present a tortuous leakage path for weft insertion fluid from the interior of the tubular section to ambient when the weft guide and shed retainer elements are in their weft receiving and guiding position.

4,907,628

PROCESS AND DEVICE FOR FORMING LEADS

Ronald J. Corey, Morris Township, Morris County, and Theodore Stavisky, West Milford, both of N.J., assignors to Fancort Industries, Inc., West Caldwell, N.J.

Filed Oct. 28, 1988, Ser. No. 264,140
Int. Cl.[4] B21F *1/00*
U.S. Cl. 140—105 **6 Claims**



1. A device for forming offset leads of an electronic component which comprises:

(a) an anvil assembly having an inner clamping unit with raised parallel edges and a pair of adjacent outer forming units, said inner clamping unit parallel edges and said outer forming units defining a pair of horizontal lead forming surfaces spaced from one another at a distance operable to receive the unformed leads of an electronic component with the body of the electronic component disposed between said lead forming surfaces, said inner clamping unit and said outer forming unit being vertically adjustable relative to one another;

(b) an upper die assembly having inner clamping unit and a pair of outer forming units defining lead forming surfaces, said upper die lead forming surfaces complementing said anvil forming surfaces;

(c) first advancing means operable to reversibly and selectively advance the inner clamping unit of said upper die assembly towards the complementary inner clamping units of said anvil assembly and to clamp therein between a first portion of the leads of an electronic component resting on said anvil clamping units with a second portion of the leads extending beyond the inner clamping units of the upper die assembly and anvil assembly;

(d) second advancing means operable to advance the inner clamping units of the upper die assembly and the inner clamping units of the anvil assembly as a unit towards said anvil outer forming units;

(e) sensing means operable to detect the advancement of the clamped electronic component to a predetermined point above said anvil outer forming units and upon such detection to deactivate said second advancing means for maintenance of the clamped electronic component at that predetermined point;

(f) adjusting means operable to selectively set the predetermined point above said anvil outer forming unit at which said sensing means detects the body of the clamped electronic component; and

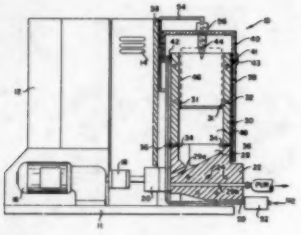
(g) means operable to advance said upper die unit outer forming units into lead forming relationship with said anvil outer forming units.

4,907,629

APPARATUS FOR LIQUEFYING A THERMOPLASTIC PLASTIC

Henning J. Claassen, Industriegebiet Hafen, 2120 Lüneburg, Fed. Rep. of Germany

Division of Ser. No. 111,335, Oct. 22, 1987, Pat. No. 4,848,420.
This application Feb. 3, 1989, Ser. No. 305,661
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 36361240
Int. Cl.[4] F27B *14/00*
U.S. Cl. 141—82 5 Claims



1. An apparatus for liquefying a polyurethane based thermoplastic comprising:

(a) a heatable sealed supply container for receiving the polyurethane based thermoplastic adhesive,

(b) a heating means for heating and liquifying the thermoplastic adhesive disposed in the supply container,

(c) a base portion arranged beneath the supply container and having a collecting trough for receiving the liquefied thermoplastic adhesive,

(d) a cover at the upper end of the supply container,

(e) a source of an inert gas which is non-reactive with the polyurethane based thermoplastic adhesive in the supply container,

(f) a conduit supplying inert gas from the source to the interior of the supply container and having an opening leading to the interior of the supply container, and

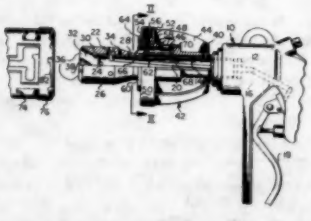
(g) a flow control connected to the conduit for periodic interruption of the flow of inert gas, whereby the thermoplastic adhesive is heated and liquefied in a vollume of non-reactive, inert gas controlled by periodically interrupting the flow thereof.

4,907,630

AUTOMATIC SHUT-OFF AND SELF-LOCKING REFUELING NOZZLE

Ernest F. Kulikowski, Marshall, and Paul J. E. Fournier, Jackson, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 25, 1988, Ser. No. 160,270
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—384 13 Claims



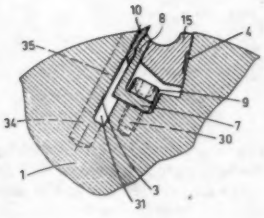
1. An automatic shut-off refueling nozzle system characterized by its ability to fill a receptacle unattended wherein the receptacle includes an elongated inlet neck having an inlet port including connection means comprising, in combination, a nozzle connected to a pressurized fuel supply having a spout having an end and an exterior surface, a manually operated valve and a sensing conduit having an open end in communication with said spout exterior surface for automatically closing the nozzle valve upon said conduit open end sensing the presence of fuel adjacent said spout exterior surface, nozzle connection means defined upon said spout for complementary mating with the inlet port connection means when said spout is fully located within the inlet neck, and a diverger communicating with said spout end constituting an extension of said spout wherein said diverger is located within the receptacle inlet neck when said spout is located within the inlet neck, said diverger including an inner chamber in communication with said spout having an axis coaxial with the spout axis, an exterior surface, and at least one discharge orifice defined in said diverger communicating with said chamber and intersecting said diverger exterior surface, said at least one orifice having an axis and direction of discharge away from said spout and obliquely related to said chamber axis and the length of the receptacle inlet neck, said sensing conduit open end being axially located between said at least one diverger orifice and said nozzle connection means.

4,907,631

BLADE ASSEMBLY FOR PLANER CUTTER HEAD

Dieter Krautzberger, Bad Kreuznach, Fed. Rep. of Germany, assignor to Babcock-BSH Aktiengesellschaft vormals Büttner-Shilde-Haas AG, Krefeld, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,552
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811601
Int. Cl.[4] B27G *13/00*
U.S. Cl. 144—230 4 Claims



1. In a cylindrical cutter head comprising:

a cutter head body having a cylindrical surface which is centered on an axis and which is formed with a plurality of radially outwardly open main grooves extending parallel to the axis and each having relative to a normal direction of rotation of the body about the axis a leading flank and a trailing flank, the flanks being generally planar and converging radially outward;

a disposable knife blade in each of the grooves against the trailing flank thereof; and

an outwardly tapered centrifugal wedge positioned in each of the grooves and braced radially between the blade and the leading flank; the improvement wherein

each groove is formed immediately forward of its trailing flank with a radially inwardly projecting groove extension, whereby wide regrindable blades can be fitted int he groove with their rear edges seated in the respective groove extensions, said cutter head further comprising

a one-piece holding bracket interposed between the knife blade and the centrifugal wedge and having a pair of unitary but relatively elastically displaceable legs one of which is engageable with the blade and has an axially

extending formation complementary to and interfitting with the formation of the blade; and

means fixing the other leg of the bracket to the cutter head body, the bracket being elastically deformable for displacement of its one leg between a normal position spaced slightly from the blade and permitting insertion and release of the knife blade and a holding position bearing on the blade and pressing same against the side of the groove, the wedge being angled and positioned such that on rotation of the body it is urged centrifugally outward and presses the one leg of the bracket into the holding position.

4,907,632

PROCESS AND APPARATUS FOR THE FEEDING OF TREE TRUNKS TO A PROCESSING MACHINE

Alfred Reuter, Oberkirch, Fed. Rep. of Germany, assignor to Gebrüder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG, Oberkirch, Fed. Rep. of Germany

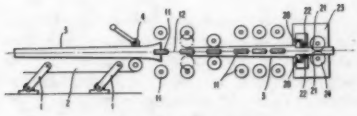
PCT No. PCT/EP87/00137, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO87/05555, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 10, 1987, Ser. No. 223,064

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3670980

Int. Cl.[4] B27C *9/04*; B27B *1/00*

U.S. Cl. 144—356 **9 Claims**



1. In a process of feeding tree trunks to a processing machine, the process including the step of cutting guide surfaces into the tree trunk at a cutting station disposed upstream of the processing machine whereafter the guide surfaces are engaged and supported by guide elements disposed between the cutting station and the processing machine, the improvement comprising centering the tree trunk along a centering line of the processing machine during the delivery of a tree trunk to the cutting station by the steps of:

providing groups of centering rolls upstream of said cutting station, said groups being spaced along said centering line, centering rolls of each said group being adjustable symmetrically between trunk centering and trunk non-centering modes, at least some of said centering rolls being driven to advance a tree trunk, and

advancing the tree trunk along said centering line successively through said groups of centering rolls while successively adjusting said groups between their centering and non-centering modes such that groups thereof located to support front and rear ends of the advancing tree trunk are in their centering modes while at least one group disposed therebetween is in a non-centering mode.

4,907,633

HANDBAG ASSEMBLY

Carol A. Eckstein, 2 Parkwood Rd., Hanover, Conn. 06350

Filed Aug. 25, 1988, Ser. No. 236,545

Int. Cl.[4] A45C *1/02, 3/08, 13/26*

U.S. Cl. 150—105 **10 Claims**

1. A handbag assembly comprising:

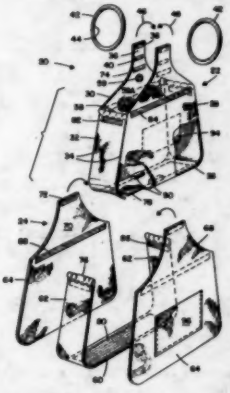
a main article carrying bag of flexible material having a first bottom and a pair of integral opposed first sidewalls terminating at a first upper rim defining an opening into said carrying bag;

an outer decorative covering of flexible material selectively attachable to and removable from said carrying bag, said outer decorative covering having a second bottom and a pair of integral opposed second sidewalls terminating at a second upper rim defining an opening into said outer decorative covering and including a pair of integral wing members of reduced dimension extending away from said second upper rim on opposite sides of said outer decorative covering;

first fastener means on a surface of said carrying bag adjacent said first upper rim;

second fastener means on a surface of each of said wing members; and

handle means having at least one aperture therethrough mounted to each of said first sidewalls adjacent said first upper rim for holding and transporting said carrying bag and its contents during use and for simultaneously supporting both of said first sidewalls during attachment of said outer decorative covering to said carrying bag and removal of said outer decorative covering from said carrying bag, each of said wing members being received through the aperture of an associated one of said handle means and folded around said handle means to extend into the interior of said carrying bag or attaching said outer decorative covering to said carrying bag;



said first fastener means being selectively matingly engageable with said second fastener means to thereby secure said outer decorative covering to said carrying bag such that said outer decorative covering overlies and substantially envelops said carrying bag.

4,907,634

WALLET-ORGANIZER

Eddie B. Yoo, 35566 Mound Rd., Sterling Heights, Mich. 48310

Filed Apr. 29, 1988, Ser. No. 188,519

Int. Cl.[4] A45C *1/06*

U.S. Cl. 150—135 **7 Claims**

1. A wallet-organizer for a passport and storage items including money, credit cards, and valuable papers comprising in combination:

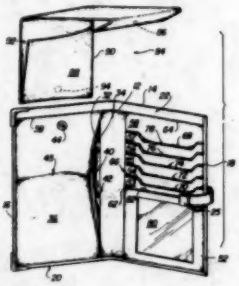
first sheet means secured together for forming a first storage section having an opening for insertion, in generally a first direction, of storage items thereinto, the first sheet means being foldable generally in half about an axis extending generally in said first direction and including adjustable first closure means located remotely from said opening for holding said first sheet means in a folded posture;

second sheet means secured together and superposed and secured to generally one half of said first sheet means for forming a second storage section including at least two distinct storage portions, one of said two distinct storage portions having a second closure means, another of said two distinct storage portions being dimensioned to receive the passport when the passport is inserted therein in gener-

ally said first direction, said second sheet means including a first attaching means;

third sheet means secured together and superposed and secured to generally the other half of said first sheet means for forming a third storage section including a plurality of individual sheets aligned in partially overlapping sequence for forming a plurality of aligned pockets into which storage items are insertable generally in said first direction, said second and third storage means being generally superposed to one another and the passport being insertable into and removable from said second sheet means when said adjustable first closure means holds said first sheet in said folded posture; and

fourth sheet means having a partial pocket for forming a fourth storage section, said fourth sheet means having a



first and second end, said first end of said fourth sheet means having a second attaching means attachable to said first attaching means and said second end of said fourth sheet means having a third attaching means attachable to said second attaching means when said second end of said fourth sheet means is doubled back over said first end of said fourth sheet means, said fourth sheet means being removable secured to said wallet-organizer in said opening of said first sheet means when said first and second attaching means are attached, said fourth sheet means being removable from said opening and insertable back thereinto when said adjustable first closure means holds said first sheet means in said folded posture, so that said first, second and third sections remain enclosed within said wallet-organizer.

4,907,635

LIFTABLE WINDOW DRAPE

Hans-Joachim Bünger, Wuppertal, and Bernhard Kuttenkeuler, Freudenberg, both of Fed. Rep. of Germany, assignors to August Bünger Bob-Textilwerk KG GmbH & Co., Wuppertal, Fed. Rep. of Germany

PCT No. PCT/EP87/00823, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/04906, PCT Pub. Date Jul. 14, 1988

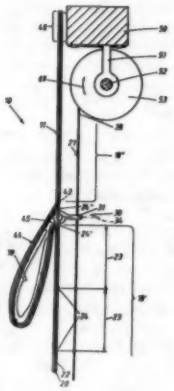
PCT Filed Dec. 23, 1987, Ser. No. 252,366

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1986, 8634909[U]; Dec. 4, 1987, 8716047[U]

Int. Cl.[4] A47H *23/00*

U.S. Cl. 160—84.1 **21 Claims**

1. A window drape, comprising a web of flexible material having opposed first and second marginal portions, one of said marginal portions being mountable on a carrier to suspend said web with the other of said marginal portions below said one marginal portion; a line for drawing said other marginal portion towards said one marginal portion so as to raise said web when the latter is suspended, said line having an end portion which is secured to said web in the region of said other marginal portion; at least one row of projecting bundles extending in a direction from said first to said second marginal portion on one side of said web; said projecting bundles being spaced from one another when said web is flat, and each of said projecting bundles including a group of weft threads mounted on said web and projecting outwardly from said one side; and a holding element engaging two of said projecting bundles in such a



manner that the portion of said web intermediate said two projecting bundles defines a pleat in all positions of said web when said web is suspended, said holding element comprising a guide section for said line, said line extending through the guide section of each said holding element.

4,907,636

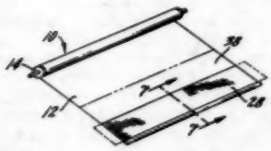
DECORATIVE WINDOW SHADE

Terry L. Simon, Rockford, Ill., assignor to Newell Co., Rockford, Ill.

Filed Jan. 9, 1989, Ser. No. 295,098

Int. Cl.[4] A47G *5/02*

U.S. Cl. 160—238 **9 Claims**



1. A combination of window shade components which are able to be assembled into an operable window shade assembly comprising:

a roller,

means for supporting said roller with respect to a window,

a flexible sheet carried by said roller,

means for attaching said sheet to said roller,

a piece of decorative material, and

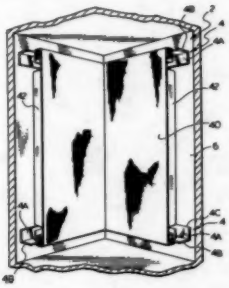
means for vertically supporting said piece of decorative material and attaching said piece of decorative material to at least a portion of said sheet,

said means for supporting and attaching said decorative material comprising a semi-rigid generally flat strip having adhesive on both sides thereof and a removable cover on both sides thereof.

4,907,637
FABRIC MOUNTING SYSTEM

R. Albert Hintsa, Woodbridge, Canada, assignor to Decoustics Limited, Rexdale, Canada

Filed Oct. 10, 1986, Ser. No. 917,604
Int. Cl.[4] E06B 3/00
U.S. Cl. 160—368.1 20 Claims



1. A fabric mounting system comprising a mounting member having means for securing said mounting member to a wall or like support, said mounting member presenting a generally planar mounting edge offset from said securing means,

a fabric engaging strip adapted to be retained by said mounting edge in one of two orientations,

said fabric engaging strip in one of said two orientations being releasably supported by said mounting edge and presenting an elongate slot running generally parallel to said mounting edge and in close proximity thereto into which fabric is inserted, and

in a second orientation which requires rotation of said strip about a longitudinal axis thereof from said first position, said mounting edge being received in said elongate slot trapping said fabric between said strip and said mounting edge,

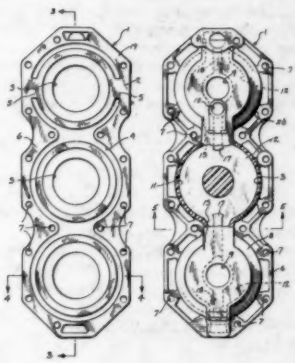
said fabric engaging strip receiving said fabric within said slot in said first orientation and in said second orientation cooperating with said mounting edge to firmly engage and retain said fabric in said slot by the receipt of said mounting edge in said slot, to define a fabric edge portion exterior to said strip covering one side of said strip, said fabric edge portion merging with a fabric face portion crossing said strip to effectively conceal said strip by placing the strip interior to said fabric edge portion and intermediate said fabric face portion and said mounting member.

4,907,638
EVAPORABLE FOAM PATTERN FOR USE IN CASTING A CYLINDER HEAD

James C. Hubbell, Fond du Lac; Gordon L. Stiller, Omro, and David D. Liegeois, Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 7, 1988, Ser. No. 281,171
Int. Cl.[4] B22D 7/02
U.S. Cl. 164—45 12 Claims

1. An evaporable foam pattern for producing a cast metal cylinder head for a multi-cylinder engine, the assembled pattern comprising an elongated block of evaporable foam material having an inner face and an outer face, a plurality of generally cylindrical head recesses disposed in said inner face and defining in the metal casting the heads for a plurality of cylinders, internal passage means disposed in said block and surrounding said recesses, inlet means connected to said passage means, outlet means connected to said passage means, said assembled pattern composed of a pair of longitudinal pattern sections having abutting surfaces, said abutting surfaces disposed generally parallel to said inner and outer faces, said

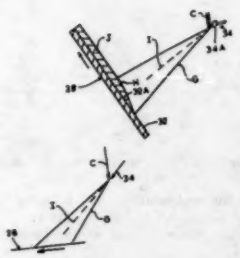


recesses disposed solely in a first of said sections, and means for joining the abutting surfaces.

4,907,639
ASYMMETRICAL GAS-ATOMIZING DEVICE AND METHOD FOR REDUCING DEPOSITE BOTTOM SURFACE POROSITY

Sankaranarayanan Ashok, Bethany, and Thomas J. Melillo, East Haven, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Mar. 13, 1989, Ser. No. 322,434
Int. Cl.[4] B22D 23/00
U.S. Cl. 164—46 19 Claims



1. In a molten metal gas-atomizing spray-depositing apparatus, the combination comprising:

(a) means for producing a stream of molten metal;

(b) means for asymmetricaly atomizing the molten metal stream into a divergent spray pattern of metal particles having a central region and leading and trailing peripheral regions on opposite sides of the center region such that the metal particles in the spray pattern at said leading peripheral region are of higher mass density than at said center and trailing peripheral regions; and

(c) means movable relatively to said spray pattern and having an area therein for receiving a deposit of the metal particles, said deposit receiving area being oriented relative to said spray pattern to initially receive the metal particles of higher mass density in the leading peripheral portion thereof.

13. In a molten metal gas-atomizing spray-depositing method, the combination comprising the steps of:

(a) producing a stream of molten metal;

(b) asymmetrically atomizing the molten metal stream into a

divergent spray pattern of metal particles having a central region and leading and trailing peripheral regions on opposite sides of the center region such that the metal particles in the spray pattern at said leading peripheral region are of higher mass density than at said center and trailing peripheral regions; and

(c) moving a substrate relative to said spray pattern for receiving a deposit of the metal particles, said substrate being oriented relative to said spray pattern to initially receive the metal particles of higher mass density in the leading edge thereof.

4,907,640

FOUNDRY GATING SYSTEM

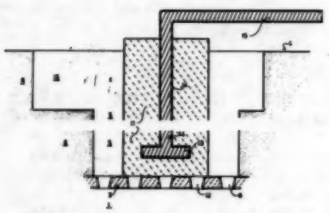
Miquel J. Jeanneret, Santiago, Chile, assignor to Marie-Therese Simian, Santiago, Chile, a part interest

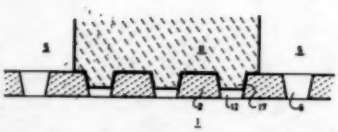
Continuation of Ser. No. 936,113, Nov. 28, 1986, Pat. No. 4,749,022. This application Jun. 6, 1988, Ser. No. 202,674

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] B22C *9/08*

U.S. Cl. 164—134 **38 Claims**





29. A method of casting molten metal in a mold comprising the steps of:

introducing the molten metal into a gating system connected to at least to one mold casting cavity;

restraining the flow of said molten metal into said mold casting cavity at least initially;

increasing the flow of molten metal after at least some of the molten metal has reached the mold gating system.

4,907,641

ROTATABLE CRUCIBLE FOR RAPID SOLIDIFICATION PROCESS

Thomas Gaspar, Bexley, Ohio, assignor to Ribbon Technology Corporation, Gahanna, Ohio

Filed Dec. 27, 1988, Ser. No. 290,274

Int. Cl.[4] B22D *11/06*

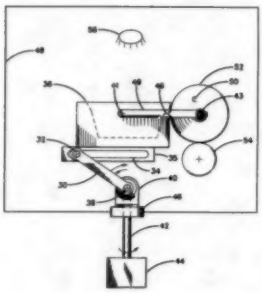
U.S. Cl. 164—423 **12 Claims**

1. An apparatus for producing filament, fiber, ribbon or film from a molten material, comprising

(a) a crucible for containing a pool of molten material at a selected horizontal level for the free surface of the pool, the crucible having an opening extending from above the free surface level to a bottom edge of the opening;

(b) a heat extracting substrate laterally disposed with respect to the crucible and adaptable for rotating about an axis of rotation; the substrate positioned adjacent the edge and the opening for confining the molten material and preventing it from overflowing downwardly out of the crucible;

(c) rotating means driven by a first drive means and connected to the crucible for tiltably rotating the crucible about an axis of rotation which is coaxial with the axis of rotation of the substrate so the crucible edge is maintained



a predetermined constant distance from the substrate, the distance being suitable for depositing molten material on the substrate; and

(d) a second drive means drivingly connected to the substrate for continuously moving the surface of the substrate upwardly past the edge and past a melt front formed at the interface of the molten material and the substrate surface.

4,907,642

CHILL MOULDING PROCESS, PARTICULARLY FOR METALS, AND APPARATUS AND MOLD FOR USE THEREIN

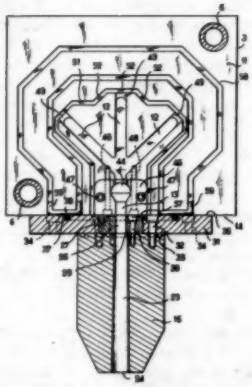
Victor Gabis, Orleans, and Christian Gailly, Meung-Sur-Loire, both of France, assignors to Centre National De La Recherche Scientifique (CNRS), Paris, France

Filed May 23, 1988, Ser. No. 201,277

Claims priority, application France, May 27, 1987, 87 07470

Int. Cl.[4] B22D *18/08*

U.S. Cl. 164—457 **25 Claims**



8. A molding method to produce a molded piece of a material of high melting point, comprising the steps of:

forming a bath of molten material;

bringing an upper end of a channel, having an internal conduit provided with a constriction at said upper end, into

releasable leak-tight fluid communication with an aperture of a mold cavity provided in a mold;

blowing an inert gas into said mold cavity while a lower end of the channel is above the bath;

lowering the lower end of the channel while maintaining said blowing until the lower end of the channel is immersed in the bath, the escape of inert gas through the conduit of the channel being thus at least retarded by this immersion;

meanwhile, detecting a parameter such as the inert gas pressure or flow rate, on which retardation of escape via the channel has an influence and comparing said parameter with a known value at which escape retardation occurs and, when said detected value equals said known value, drawing a vacuum in the mold cavity for aspirating the fused material into the mold cavity upon detection of said retardation until said mold cavity is substantially filled;

allowing the material to solidify in the constriction;

lifting up said mold and said channel so as to move said lower end of said channel out of said bath;

spacing apart said mold and said channel so as to rupture in tension solidified material in said constriction;

allowing material remaining in said channel to return into said bath of molten material; and

demolding said molded piece by separating the mold into plural portions.

4,907,643

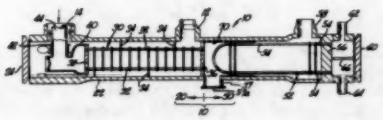
COMBINED HEAT EXCHANGER SYSTEM SUCH AS FOR AMMONIA SYNTHESIS REACTOR EFFLUENT

Bernard J. Grotz, Pasadena, and Clive R. Good, Whittier, both of Calif., assignors to C F Braun Inc., Alhambra, Calif.

Filed Mar. 22, 1989, Ser. No. 327,014

Int. Cl.[4] F28F *1/00*

U.S. Cl. 165—1 **26 Claims**



26. A process for heat exchanger system for cooling or heating a fluid stream of process fluid, comprising the steps of:

passing the fluid stream through two heat exchange steps in series, comprising exchanging heat between the fluid stream and a first exchange fluid by passing the fluid stream through a tube side of a single pass bundle, and exchanging heat between the fluid stream and a second exchange fluid by passing the fluid stream through a shell side of a multi-pass bundle, wherein the first and second tube bundles are placed in a single shell;

separating the fluids in respective shell sides of the two heat exchange steps by a tubesheet of the single pass bundle and providing a means to seal between the tubesheet and the shell;

orienting a flow scheme such that operating conditions and/or physical properties of the process fluid in the shell side of the multi-pass bundle is more aggressive at an end nearer the tubesheet of said single pass bundle than at an end farther from the single pass bundle; and

protecting the shell from the process fluid at the more aggressive condition of the process fluid.

4,907,644

METHOD AND CONTAINER DEVICE FOR THE PROTECTION AND THERMAL CONDITIONING OF APPARATUS, IN PARTICULAR ELECTRONIC APPARATUS GENERATING HEAT

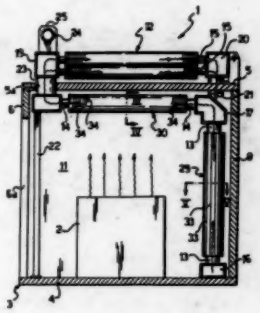
Alberto Ghiraldi, Via Palatino 8, Milan, 20148, Italy

Filed Apr. 21, 1988, Ser. No. 184,603

Claims priority, application Italy, Apr. 21, 1987, 20188 A/87

Int. Cl.[4] F28D *15/00*; H01L *23/46*

U.S. Cl. 165—32 **15 Claims**



1. A device for the protection and thermal conditioning of apparatus such as electronic apparatus generating heat, comprising a box-shaped structure in which is defined an ambient adapted to hold the apparatus and a heat exchanger in which flows a thermal carrying fluid adapted to absorb heat within said ambient and dissipate heat outside of said ambient and which includes at least one conduit extending in the said ambient, and at least one housing over the said at least one conduit forming an annular space between the said housing and said conduit and predetermined quantity of material contained in the said annular space, said material being susceptible to a change of state at a temperature which is lower than a temperature which is related to a maximum predetermined temperature for the said ambient predetermined for the operation of said apparatus, said box-shaped structure comprising insulated lateral walls and an insulated ceiling, said heat exchanger comprising (i) a plurality of internal vertical conduits and a corresponding plurality of internal horizontal conduits extending in the said ambient and supported respectively in close proximity to one of the said lateral walls and said ceiling, (ii) a plurality of external conduits supported by the box-shaped structure outside the said ambient, and (iii) connecting means interconnecting all of said conduits to form said heat exchanger and permit the flow of a thermal carrying fluid therein by natural convection.

4,907,645

DEVICE FOR VENTILATING RHEOSTATS AND/OR FLUID RADIATORS IN A LOCOMOTIVE

Jean-Claude Dumas, Soisy Sous Montmorency; Maurice Thoraval, Argenteuil, and Gérard Genuit, Bezons, all of France, assignors to Societe Anonyme dite : ALSTHOM, Paris, France

Division of Ser. No. 267,630, Oct. 31, 1988, Pat. No. 4,840,221, which is a continuation of Ser. No. 011,815, Feb. 6, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 299,155

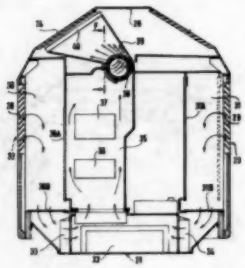
Claims priority, application France, Feb. 11, 1986, 8601847; Jan. 27, 1987, 8700939

Int. Cl.[4] F28F *13/12*; B61C *5/00*

U.S. Cl. 165—41 **5 Claims**

1. A device for ventilating at least one of a fluid radiator unit and a starting and braking rheostat unit in a locomotive having at least one side wall and a roof, which locomotive is powered electrically, by means of an electrical combustion engine, or by

a combination thereof, said at least one unit requiring ventilation being disposed below and adjacent the locomotive roof, said device comprising at least one tangential fan having a horizontal axis of rotation placed longitudinally relative to the locomotive and blowing air towards said at least one unit, and at least one air intake opening being placed in a side wall of the locomotive, wherein said at least one unit comprises a rheostat unit having rheostats disposed in successive vertical layers



beneath the roof of the locomotive in the vicinity of a second side opening within a side of the locomotive roof through which air is discharged, wherein said tangential fan is disposed beneath the locomotive roof at the same level as the rheostats and means defining a flowpath from said at least one air intake opening leading to said tangential fan and thence through said rheostat unit and discharging through said second side opening.

4,907,646

HEAT EXCHANGER

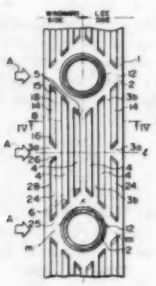
Osamu Aoyagi, Otsu; Shoichi Yokoyama, Shiga; Hirotada Kaneko, Kusatsu; Eiji Nakatsuno, Otsu, and Shotaro Ito, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1988, Ser. No. 262,821

Claims priority, application Japan, Oct. 30, 1987, 62-276101; Oct. 30, 1987, 62-276102; Feb. 21, 1988, 63-11152

Int. Cl.[4] F28D *1/04*

U.S. Cl. 165—151 **8 Claims**



1. A heat exchanger having a plurality of tabular fins which are arranged in parallel at fixed intervals and through which the air is allowed to flow and a plurality of tubes which are inserted in each of said tabular fins at a right angle therewith and disposed perpendicular to the direction of air flow and through which a fluid is allowed to flow, a group of cutouts being formed on tabular fin surfaces and between adjacent those of said fins, projecting in the direction of arrangement of said fins, wherein:

said group of cutouts are divided into an upstream-side subgroup and a downstream-side subgroup, as viewed in the direction of the air flow, with a line passing through the center of each of said tubes serving as a boundary therebetween, and a central flat portion is provided which is located on said center line and between said upstream-side subgroup and said downstream-side subgroup;

said upstream-side subgroup of cutouts include three rows of cutouts which are disposed on a central side located close to said center line, on an outer side located on said upstream side, and on an intermediate side located between said central side and said outer side;

each of said cutouts in each of said rows is formed by a pair of rising portions whose ends project from said fin surface as well as a bridging portion spanning said rising portions, said cutouts being formed such as to project alternately on the front side and the rear side of said fin surface;

an intermediate flat portion is formed between adjacent those of said cutouts, said cutouts being arranged parallel with each other with said intermediate flat portion placed therebetween;

each of said rising portions which are adjacent to said tubes among said rising portions of said cutouts is located on a line substantially parallel with a line tangential to an outer periphery of said tube;

each of said cutouts on said central side and said intermediate side is formed into the shape of a trapezoid with equal legs, two parallel sides thereof being perpendicular to the main direction of said air flow, the short side of each of said trapezoids with equal legs being arranged such as to be located on the center line side;

said outer-side cutout is constituted by a pair of parallelogrammic medium-size cutouts which are obtained by separating a cutout having the shape of said trapezoid with equal legs into two, and a dividing flat portion is provided between said medium-size cutouts;

said rising portions of said pair of medium-size cutouts that are respectively disposed on both sides of said dividing flat portion are oriented in such a manner that an interval therebetween becomes smaller toward the leeward side in said main direction of air flow; and

said leeward-side subgroup of cutouts includes a plurality of cutouts.

4,907,647

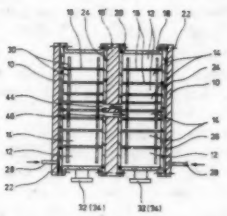
HEAT EXCHANGER

Alexander Faller, Sr., and Alexander Faller, Jr., both of Rottenburger Strasse 14, Ergoldsbach, Fed. Rep. of Germany 8305

Continuation of Ser. No. 939,127, Nov. 14, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 220,372

Int. Cl.[4] F28D *7/02*

U.S. Cl. 165—164 **1 Claim**



1. A heat exchanger for indirect heat transfer between a heat yielding medium and a heat absorbing medium, comprising:

first spirally-disposed wall surfaces having a straight generatrix and defining first and second channels in close thermal relation and through which a heat yielding medium and a heat absorbing medium are respectively flowable, said first wall surfaces having a pair of oppositely-disposed

axial edges lying substantially perpendicularly to the direction of medium flow through said channels and defining the open sides of said first and second channels;

second spirally-disposed wall surfaces having a straight generatrixs and defining third and fourth channels in close thermal relation and through which a heat yielding medium and a heat absorbing medium are respectively flowable, said second wall surfaces having a pair of oppositely-disposed axial edges lying substantially perpendicularly to the direction of medium flow through said third and fourth channels and defining the open sides of said third and fourth channels;

a separation wall between said first and second wall surfaces;

said first and fourth channels and said second and third channels being disposed in fluid communication through said separation wall for serial flow of a medium between said first and fourth channels and between said second and third channels;

a first elastically flexible seal member interposed between one side of said separation wall and said one of said axially-disposed opposite edges of said first wall surfaces;

a second elastically flexible seal member interposed between the second side of said separation wall and said one of said axially-disposed opposite edges of said second wall surfaces;

a first end plate disposed along one of said oppositely-disposed axial edges of said first wall surfaces to close one of said open sides and to define one of two axial boundaries of said first and second channels;

a third additional elastically flexible seal member interposed between said first end plate and said one of the axially-disposed opposite edges of said first wall surfaces;

a second end plate disposed along one of said oppositely-disposed axial edges of said second wall surfaces to close one of said open sides and to define one of two axial boundaries of said third and fourth channels;

a fourth additional elastically flexible seal member interposed between said second end plate and said one of the axially-disposed opposite edges of said second wall surfaces, each of said second and fourth additional elastically flexible seal members being positioned for conforming abutment with the respective axial edges of said first and end plates to provide enhanced protection against leakage of medium beyond the respective axial boundary of said channels;

said first and second wall surfaces being each formed of a single unitary bent steel strip; and

clamp fitting means for releasably clamping together said first and second end plates, said separation wall and said first and second wall surfaces.

4,907,648

PLASTIC CROSSCURRENT HEAT EXCHANGER

Friedel Emmerich, Seeheim-Jugenheim; Dieter Franitza, Darmstadt; Heinrich Hartmann, Reichelsheim, and Klaus Kerk, Griesheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 264,849

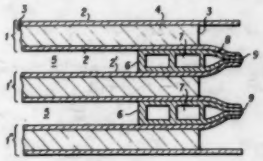
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1987, 8714559

Int. Cl.[4] F28F *3/10*

U.S. Cl. 165—166 **5 Claims**

1. A crosscurrent heat exchanger body, which comprises:

a stack of joined plastic flow web plates (1), consisting of two planar, parallel cover plates (2) and parallel webs (3) joined integrally to said cover plates, which enclose parallel hollow flow chambers (4), with a number of web plates being arranged in a stack so that their hollow chambers can carry flow in parallel, and so that a hollow cross-flow chamber (5) is located between each of two such web plates in succession in the stack, wherein the cover layers (2, 2') of each two web plates that are adjacent to a cross-flow hollow chamber (5) are sloped toward one another at their ends across the hollow chamber (5) between them, and are joined to one another over the entire width, and wherein said hollow cross-flow chambers (5) contain



spacers (6) of the thickness of the hollow chambers, said spacers (6) containing hollow cross-flow chambers (7).

4,907,649

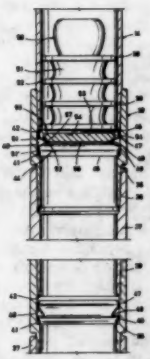
RESTRICTION SUBS FOR SETTING CEMENT PLUGS IN WELLS

Robert E. Bode, 4545 Louetta Rd., Apt. 2902, Spring, Tex. 77388

Continuation of Ser. No. 50,735, May 15, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 266,266

Int. Cl.[4] E21B *33/05, 23/10, 47/09*

U.S. Cl. 166—70 **14 Claims**



1. A restriction sub for use in providing a surface indication of the downhole position of a plug member in a pipe string, comprising: a tubular body having means at its ends for connecting the body in a pipe string, said body having a bore and an internal annular recess, said bore having a first inner diameter and said recess having a second inner diameter, said second inner diameter being larger than said first inner diameter; a circular sleeve mounted in said recess, said sleeve having an inner peripheral surface defined between upper and lower end surfaces, said inner peripheral surface of said sleeve defining an inwardly extending restriction section for providing a yieldable obstruction to the passage of said plug member downward through said bore of said body, said restriction section forming a unitary portion of said sleeve and being located entirely between said upper and lower end surfaces.

4,907,650

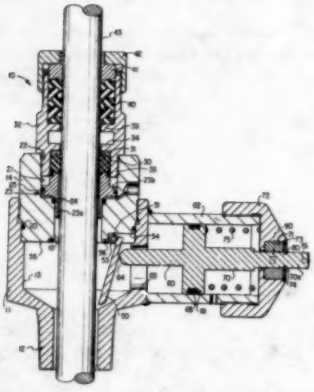
WELLHEAD WITH SAFETY VALVE FOR PUMPING WELL

Robert L. Heinonen, Dallas, Tex., assignor to Double E, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 313,624, Feb. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 208,980, Jun. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 77,692, Jul. 24, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 375,249

Int. Cl.[4] E21B *33/03*

U.S. Cl. 166—80 **22 Claims**



15. A wellhead for operating a pumping unit polished rod in a pumping well comprising:

a wellhead housing having a bore for a polished rod and adapted for mounting on a well tubing;

seal means in said housing for sealing around a polished rod moving through said bore of said housing;

a flapper type valve mounted in said housing for closing said bore upon removal of a polished rod from said bore; and

wellhead fluid pressure responsive valve operator means coupled with said valve permitting said valve means to remain open when said wellhead is under fluid pressure, and for closing said valve means in the absence of said polished rod from said bore and the reduction of fluid pressure in said housing below a predetermined level, said valve operator means including a prong engageable with said valve means for moving said valve means from an open to a closed position and a piston connected with said prong, one side of said piston communicating with fluid pressure in said housing for holding said piston and prong at a valve-open position, and a spring engaged with said piston for biasing said piston and said prong toward a valve-closed position, said piston and said prong being mounted in a cylinder secured on a side of said housing and said prong extending through an opening in said housing from said cylinder.

4,907,651

METAL-TO-METAL PACKER SEAL FOR DOWNHOLE DISCONNECTABLE PIPE JOINT

Sami Bou-Mikael, Kenner, La., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 21, 1987, Ser. No. 136,617

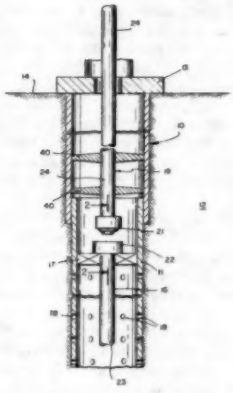
Int. Cl.[4] E21B *33/10*

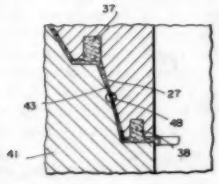
U.S. Cl. 166—114 **13 Claims**

1. In an elongated pipe string comprised of interconnectable pipe lengths which, when engaged, form separable upper and downhole pipe segments, for conducting a treating fluid into a subterranean well, said pipe string including a separable metal-to-metal seal joint adapted to fluid tightly engage said upper and downhole segments, and which is resistant to corrosive deterioration when exposed to a corrosive atmosphere caused by said treating fluid,

the downhole segment of said pipe string having an upwardly facing end receptacle which defines at least one frusto-conical sealing surface, and a gasket deflecting surface, intersecting said at least one frusto-conical sealing surface,

the upper segment of said pipe string having a connector at the lower end thereof aligned in axial registry with said upwardly facing end receptacle, and having a peripheral





seal area having means to form a first metal-to-metal ring of contact with a portion of said at least one frusto-conical sealing surface, to define an annular extrusion compartment at each opposite side of the said first metal-to-metal ring of contact, between spaced apart contiguous surfaces of the connector and the end receptacle,

at least two gaskets comprised of an extrudable metal, each of which substantially occupies each of said annular extrusion compartment to form second metal-to-metal annular seals compressed between the pipe string upper segment, and the pipe string downhole segment.

4,907,652

PACKER HARROW IMPLEMENT

James W. Henry, and Paul G. Nadeau, both of Alberta, Canada, assignors to Rena-Vertec Inc., Vermilion, Canada

Filed Jan. 27, 1989, Ser. No. 302,669

Int. Cl.[4] A01B *73/00*

U.S. Cl. 172—180 **11 Claims**

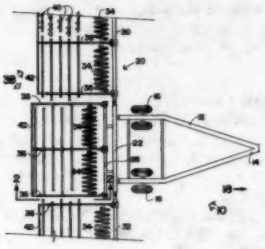
1. An agricultural implement adapted for towing behind a driven vehicle in a first forward direction and comprising:

an elongated frame assembly extending substantially transverse to said first direction;

means for supporting a harrow assembly comprising a plurality of harrow arms extending in a rearward direction,

said harrow arms being fixedly attached to said frame assembly at spaced locations therealong;

a plurality of rotatable soil packer coils, each of which is located entirely between a respective pair of harrow arms, and each of which is pivotally mounted to said frame



adjacent said respective pair of harrow arms by first and second link means at either end of said coil. whereby said link means allows for up and down movement of said packer coils independent of and unobstructed from said harrow arms

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4,907,653

IMPLEMENT CONTROL SYSTEM

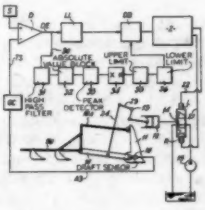
Regis Bellanger, Beauvias, France, and William J. Graaskamp, Guelph, Canada, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 10, 1987, Ser. No. 36,937

Claims priority, application United Kingdom, Apr. 10, 1986, 8608760

Int. Cl.[4] A01B *63/112*

U.S. Cl. 172—10 **10 Claims**



1. A tractor implement draft force control system comprising:

means for setting a desired value of implement draft force,

means for sensing the actual value of implement draft force,

comparator means for comparing the desired and actual values of implement draft force to provide a draft force error signal,

control means responsive to the error signal to control a working depth and hence the draft force of the implement,

deadband means operating on the error signal to render error signals within the deadband ineffective to control the working depth of the implement, and

deadband control means which process the error signal to determine those components of the error signal above a predetermined frequency and then adjust the width of the deadband in dependence on those components of the error signal above a predetermined frequency.

4,907,654

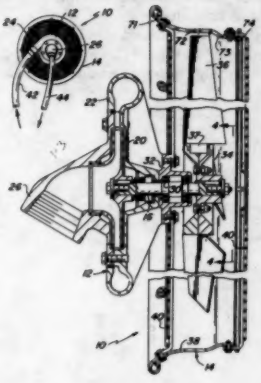
WATER DRIVEN FAN SYSTEM FOR FIREFIGHTING

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Sep. 12, 1988, Ser. No. 242,494

Int. Cl.[4] A62C *39/00*

U.S. Cl. 169—70 **9 Claims**



1. A water driven fan system for use in positive pressure ventilation in the fighting of fires comprising

a portable fan means including

shaft means including a fan shaft and a turbine shaft,

a fan including a plurality of fan blades mounted on said fan shaft to rotate therewith and to extend radially therefrom,

and a water powered turbine for driving said fan including a housing defining an enclosed turbine chamber, and a runner mounted on said turbine shaft to rotate therewith within said turbine chamber, said housing having an inlet and an outlet for directing the water driving said turbine into and out of said turbine chamber, said housing being constructed to direct said water to cause rotation of said runner,

means for delivering water under pressure from a pressurized source to said turbine inlet for causing operation of said turbine to drive said fan, said water being discharged from said outlet at a substantial positive pressure,

and a flow control valve means for controlling the flow of water from the pressurized source to said turbine inlet,

said flow control valve means having an OFF position in which said fan means is inoperative and a FAN position in which water is directed to said turbine inlet for causing operation of said turbine to drive said fan whereby a firefighter can direct a clearstream of air into a structure or toward a fire for fighting the fire by positive pressure ventilation.

4,907,655

PRESSURE-CONTROLLED WELL TESTER OPERATED BY ONE OR MORE SELECTED ACTUATING PRESSURES

Joe C. Hromas, both of Sugar Land, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Apr. 6, 1988, Ser. No. 178,091

Int. Cl.[4] E21B *34/10*

U.S. Cl. 166—321 **33 Claims**

1. A well tool adapted to be positioned in a well bore and to conduct fluids produced from an earth formation into a pipe string extending upwardly to the surface, comprising:

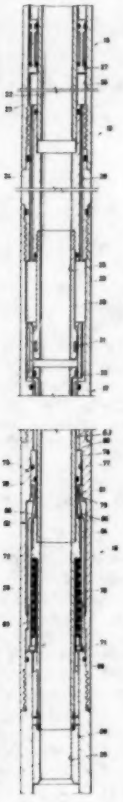
a tubular body having an axial flow passage and arranged to be tandemly connected in a pipe string;

tester valve means in said tubular body arranged to open said

flow passage in response to an increase of the pressure of the well annulus fluids to a first pressure level above normal hydrostatic;

means for closing said tester valve means in response to a subsequent decrease of the pressure of the well annulus fluids to a value below said first pressure level including a chamber in said tubular body, and floating piston means dividing said chamber into a first portion for containing a compressible fluid and a second portion adapted to be filled by well bore fluids;

reference valve means on said tubular body for controlling the admission of well bore fluids to said second chamber portion including passage means communicating said



second chamber portion with the well bore, a valve element movable from a passage-opening first position permitting well annulus fluids to flow through said passage means into said second chamber portion to a second, passage-closing position; and

annulus pressure operated means operable upon an increase of the pressure of the well annulus fluids to a predetermined value that is less than said first pressure level to enable said valve element to move to said closed position and thereby trap well bore fluids at a reference pressure in said second chamber portion which is transmitted to said compressible fluid by said floating piston,

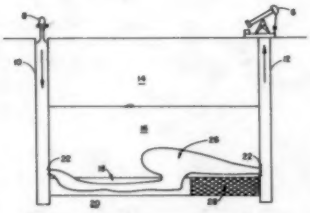
said annulus pressure operated means including means defining a piston-actuator chamber in said tubular body, normally-closed means for blocking the entrance of well annulus fluids into said piston-actuator chamber and operable only upon an increase of the pressure of the well annulus fluids to said predetermined value for admitting well annulus fluids into said piston-actuator chamber, and a piston arranged in said piston-actuator chamber for moving said valve element to said passage-closing position in response to the pressure of well annulus fluids entering into said piston-actuator chamber.

4,907,656

METHOD FOR PREVENTING STEAM CHANNELLING INTO A NON-AQUIFER BOTTOM WATER ZONE

J. Michael Sanchez; E. Thomas Strom, both of Dallas, Tex.; Paul Shu, Princeton Junction, N.J., and Bassem R. Alameddine, Carrollton, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,129
Int. Cl.[4] E21B *33/138, 43/24*
U.S. Cl. 166—270 **17 Claims**



1. A method for closing pores in a bottom water zone of a formation comprising:

(a) heating by a steam flooding enhanced oil recovery process the bottom water zone to a temperature sufficient to cause a temperature activated gellable mixture to form a solid gel;

(b) terminating steam injection into the formation upon reaching a temperature sufficient in said zone to activate said mixture;

(c) injecting into said formation the temperature activated gellable mixture that comprises water, sufficient amounts of a polymer selected from a member of the group consisting of polyvinyl alcohol, polyacrylamide, sulfonated polyvinyl alcohol and poly(acrylamide-co-acrylamido-2-methylpropane sulfonate) cross-linked in situ with a phenolic compound and an aldehyde producing compound which mixture enters said heated bottom water zone; and

(d) activating said mixture by the temperature in the bottom water zone which temperature causes a solid gel to form and subsequently closes pores in said bottom water zone.

4,907,657

METHOD FOR PROTECTING A SHALLOW WATER WELL

Bobby E. Cox, Kenner, La., assignor to Shell Offshore, Inc., Houston, Tex.

Continuation of Ser. No. 936,220, Dec. 1, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 241,802
Int. Cl.[4] E02B *17/02;* E02D *31/00*
U.S. Cl. 175—9 **11 Claims**

1. A method of drilling a shallow-water offshore well and reinforcing a well structure from a jack-up type drilling platform having a derrick and associated drilling and hoisting systems, said platform being of a design providing for the derrick to be moved laterally on the platform within a prescribed work area so that the center line of the derrick is positioned over open water to one side of the platform, said method comprising the steps of:

(a) drilling and completing the well by steps comprising:

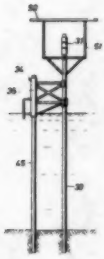
(1) locating the jack-up type drilling platform at a selected shallow-water drilling location with its leg footings on the ocean floor and its operating deck jacked-up to normal operating position above the water surface and wave action;

(2) lowering a large-diameter well conductor through the water below the derrick and setting it in the ocean floor;

(3) drilling a well through said well conductor and closing the top of the well with a wellhead above the water surface and wave action;

(b) establishing an interconnecting reinforcing structure in which said well conductor and a plurality of piles form legs of the structure, comprising:

(1) providing a pile guide template frame substantially polygonal in plan view comprising at least two spaced-apart vertical pile guides connected together by laterally-extending support members with additional laterally-extending support members arranged to extend between and be connected at one end to each of the pile guides and at the other end to the well conductor when positioned thereagainst, with the pile guides being at a selected distance from the well conductor;



(2) transporting the pile guide template frame to the offshore well;

(3) positioning and suspending said frame in a manner such that the other ends of the additional laterally-extending support members are operatively positioned adjacent the wall of said well conductor, said position being such that at least said other ends of said support members at the top of the frame are above the surface of the water and the lowermost portion of the frame does not rest upon the ocean floor;

(4) lowering the piles through said pile guides of said suspended frame and driving said piles into the ocean floor;

(5) securing the suspended pile guide template frame above the ocean floor by fixedly connecting each pile to its surrounding pile guide; and

(6) operatively connecting at least said other ends of said laterally-extending support members at the top of the frame to the well conductor, whereby said frame forms the interconnecting reinforcing structure between the piles and the well conductor, substantially polygonal in plan view, to resist the effect of wind and wave forces encountered by said well conductor.

4,907,658

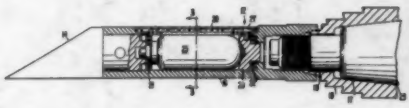
PERCUSSIVE MOLE BORING DEVICE WITH ELECTRONIC TRANSMITTER

Gerald A. Stangl, Perry; Douglas W. Lee, Enid, and Dirk A. Wilson, Stillwater, all of Okla., assignors to Gas Research Institute, Chicago, Ill.

Filed Sep. 29, 1988, Ser. No. 250,954

Int. Cl.[4] E21B *47/024, 47/09*

U.S. Cl. 175—19 **7 Claims**



1. In an unguided percussive mole boring device for use with a flexible hose connected to the mole boring device for providing a source of percussive power to drive the mole boring device, percussive means connected to the flexible hose and driven by a percussive power source for impacting the mole boring device, the improvement comprising:

a drilling assembly attached at a forward end of the mole boring device and a boring element attached to the forward end of said drilling assembly, said drilling assembly including a transmitter housing located behind and substantially adjacent said boring element;

an enclosed transmitter unit disposed within said transmitter housing, said transmitter unit enclosing a transmitter therein, said transmitter housing including a plurality of windows extending equiangularly around the circumferential exterior surface of said transmitter housing, said windows transparent to the frequency of transmission of said transmitter, said transmitter unit located substantially adjacent a forward end of said mole boring device to accurately transmit the location of the forward end of said boring element; and

isolation means disposed in said housing for isolating said transmitter from shocks created by said percussive means impacting on said mole boring device, a diametric clearance provided between said transmitter unit and said windows allowing for axial movement of said transmitter unit in said housing to effectively cushion said impacts.

4,907,659

POWERED SOIL-SAMPLER

Juergen Ludwig, Greenville, Miss., assignor to BASF Corporation, Parsippany, N.J.

Filed Jan. 19, 1988, Ser. No. 145,294

Int. Cl.[4] E21B *10/02*

U.S. Cl. 175—20 **16 Claims**

1. A powered apparatus for taking an undisturbed soil sample comprising:

A. an earth auger comprising:

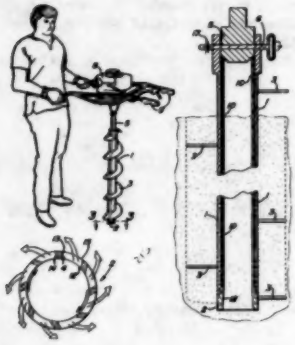
1. a hollow central shaft within which is a removable sample-receiving tube;

2. a helical conveyor, the conveyer extending radially outward from, and secured firmly to, the outer surface of the hollow central shaft;

3. grinding teeth located on the lowermost end of the auger, the teeth being substantially vertical when the apparatus is in an upright position, the teeth having leading vertical surfaces which are angled radially outward with respect to the rotational direction, so that the ground soil is forced radially outward whereby the ground soil is prevented from interfering with the collection of the undisturbed soil sample;

4. a bottleneck formed by a tapered surface within the

hollow central shaft, the bottleneck being located shortly above the grinding teeth, the minimum diameter



of the bottleneck being smaller than the inside diameter of the sample-receiving tube; and

B. a power means for rotating the auger.

4,907,660

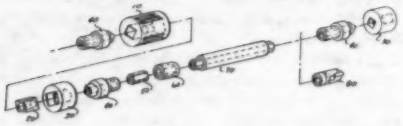
INTERCHANGEABLE SECTIONAL MINING DRILL AND BOLT DRIVER SYSTEM

Arnol Staggs, and Margarita Flores, both of 1155 Lincoln, Wyandotte, Mich. 48192

Filed Mar. 21, 1988, Ser. No. 170,993

Int. Cl.[4] E21B *17/00*

U.S. Cl. 175—320 **18 Claims**



3. In a mining drill steel system for use with a drilling machine;

the improvement comprising an interchangeable, sectional driver including:

(a) a replaceable geometric driver having an external geometric cross-section along a longitudinal length of said geometric driver, said external cross-section defining first and second male fittings at a first end and a second end, respectively, of the geometric driver, said first end being engagable within a female fitting of a chuck of a drilling machine, said square geometric driver having a longitudinal bore extending through the length of the geometric driver, said second end thereof having retaining apertures extending through opposing sidewalls of said geometric driver;

(b) a bolt wrench-drill driver having a first end and a second end, the first end thereof having a first geometric recess therein defining a first female fitting engagable with an end of the geometric driver, the second end of the bolt wrench-drill driver having a second recess therein defining a second female fitting offset rotationally about a longitudinal axis of said bolt wrench-drill driver by 45° from said first recess, said first and second recesses having retaining apertures extending therefrom and passing through side walls of said bolt wrench-drill driver;

(c) a combination driver having a first end with an exterior geometric cross-section defining a third male fitting engagable with a female fitting of said bolt wrench-drill driver, and the combination driver including a second end having an interior polygonal aperture defining a third female fitting, said first end of the combination driver having retaining apertures formed through opposing side walls to secure said combination driver to said bolt wrench-drill driver, and said third female fitting having a clip-engaging aperture spaced from said second end of the combination driver;

(d) first and second retaining members for releasably engaging aligned retaining apertures to secure said geometric driver with said bolt wrench-drill driver, and to secure said bolt wrench-drill driver with said combination driver.

4,907,661

DRILL PIPE TUBING AND CASING PROTECTORS

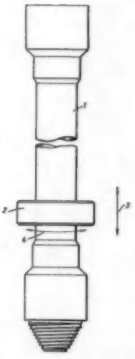
Stephen F. Lloyd, Aberdeen, United Kingdom, assignor to Giselle Mary Herrera, Westhill Aberdeen, United Kingdom, a part interest

Filed May 23, 1988, Ser. No. 197,227

Claims priority, application United Kingdom, May 21, 1987, 8712024

Int. Cl.[4] E21B *17/10*

U.S. Cl. 175—325 **7 Claims**



6. A system of drill pipe tubing and casing protectors comprising:

(a) a first annular protector;

(b) a second annular protector having an external diameter smaller than the first protector and located below the first protector; and

(c) at least one retaining ring arranged immediately above the second annular protector to prevent contact between the protector and a drill pipe joint.

4,907,662

ROTARY DRILL BIT HAVING IMPROVED MOUNTING MEANS FOR MULTIPLE CUTTING ELEMENTS

John D. Deane, and Percy W. Schumacher, both of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 61,413, Jun. 12, 1987, which is a continuation of Ser. No. 830,399, Feb. 18, 1986, Pat. No. 4,682,663. This application Aug. 13, 1987, Ser. No. 84,892

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

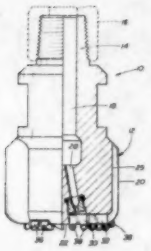
Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—329 **10 Claims**

1. In a drag type rotary drill bit having a bit body defining a lower exterior surface;

a plurality of unitary integral hard metal holders secured in a spaced relation to each other directly to said bit body each having a projecting end portion extending from said lower surface of the bit body; and

a plurality of polycrystalline diamond cutting elements mounted directly on the projecting end portion of each of said holders, each cutting element having a planar leading cutting face and a cutting edge along said face projecting from an associated holder for engaging in cutting relation a formation to be cut, each of the cutting edges of the



plurality of cutting elements for each holder being spaced laterally from the cutting edge on any adjacent cutting element and in a cutting plane extending generally radially of the axis of rotation of the bit, said holder providing reinforcement and rigidity to said cutting elements in resisting stresses resulting from the cutting operation.

4,907,663

DRILLING TOOL

Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Sep. 19, 1988, Ser. No. 246,369

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731630

Int. Cl.[4] E21B *10/02*

U.S. Cl. 175—330 **6 Claims**

1. Drilling tool comprising a hollow axially extending cylindrically shaped holder having a first end and a second end and spaced apart in the axial direction, a hollow axially extending cylindrically shaped drilling member having a first end and a second end spaced apart in the axial direction, said drilling member being detachably connected to said holder and one of said holder and drilling member being telescopically engageable within the other, means on one of said holder and drilling member for engagement with receiving means in the other one of said holder and drilling member, wherein the improvement comprises that said means comprises circumferentially and axially extending plate-like wall parts having a first axially extending end connected to the one of said holder and drilling member and a second axially extending free end spaced circumferentially from the first end, and said receiving means comprising recesses in the other one of said holder and drilling member arranged to receive said wall parts and each said recess having an axially extending abutment arranged to be contacted by the second free end of one of said wall parts, said wall parts are resiliently articulated to the one of said holder and drilling member, said free end being radially displaceable relative to the one of said holder and drilling member to which said first end is connected for engagement within one of said recesses, the free ends of said resilient wall parts project from the one of said holder and drilling member transversely of the axial direction, the one of said holder and drilling member containing said wall parts receive the other one of said holder and drilling member therein in a telescoping manner and the free second ends of said wall parts project inwardly from the one of said holder and drilling member, said resilient wall parts are formed as a part of said holder, said recesses are openings formed in said drilling member with said openings being closed on opposite sides extending transversely of the axial direction.

4,907,664

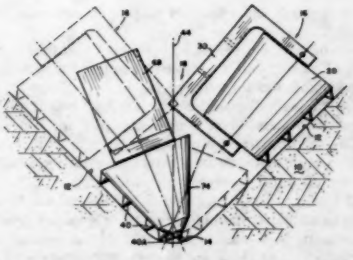
ROCK CUTTING TOOL

James H. Cobbs, 5350 E. 46th St., Tulsa, Okla. 74135, and David C. Cobbs, 669 E. 139 Pl., Glenpool, Okla. 74033

Filed Dec. 16, 1988, Ser. No. 285,594

Int. Cl.[4] E21B *10/10, 10/16*

U.S. Cl. 175—374 **6 Claims**



1. An apparatus for cutting away a rock face of a relatively hard rock of known compressive strength, such as for drilling large diameter subterranean holes or for removing rock at the earth's surface, comprising:

a cutting head rotated about an axis and mounted for movement relative to a rock face, the cutting head being formed of a plurality of drilling members, at least one of the drilling members having an external surface, the drilling member having an axis of rotation coincident with the conical axis thereof;

means for mounting each of said drilling members for rotation about its said axis of rotation;

a plurality of spaced apart indentors secured to said drilling member external surface, each indentor having an end point, the indentors being adaptable to penetrate into the rock face upon the application of working force a distance P, and wherein said indentor end points are spaced a distance of not greater than 7 P apart; and

wherein the apparatus includes means of applying to it a force moving the apparatus in a preselected direction of drilling, and wherein the apparatus is configured to attain a rock face configuration wherein the slope of the rock face relative to the direction of drilling is between 30° and 60°.

4,907,665

CAST STEEL ROCK BIT CUTTER CONES HAVING METALLURGICALLY BONDED CUTTER INSERTS

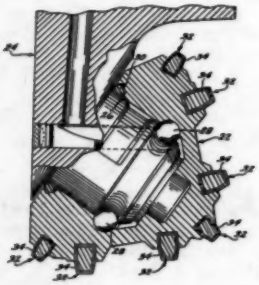
Naresh J. Kar, Westminster; William J. Salesky, Irvine, and Steven J. Guzowski, Costa Mesa, all of Calif., assignors to Smith International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 76,510, Jul. 22, 1987, abandoned, which is a continuation of Ser. No. 897,947, Aug. 19, 1986, abandoned, which is a continuation of Ser. No. 655,140, Sep. 27, 1984, abandoned. This application Jan. 13, 1989, Ser. No. 297,504

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—410 9 Claims



1. A cutting tool to be used for shaping of materials, the tool comprising:

at least one hard cermet insert forming a first base end and a second cutting end, said insert comprising a metal carbide in a suitable metal binder phase;

a first metal layer disposed on the first base end of the cermet insert, said metal layer being selected from a group consisting of copper and copper alloys;

a second high temperature protective metal layer disposed on top of said first copper metal layer; and

a steel matrix surrounding said first base end of the cermet insert, the matrix having been cast in a molten state into a suitable mold while the base end of the layered cermet insert is held in the mold in operative position while the molten steel encompasses said base of said insert, the metal of the first copper layer forms a barrier to block diffusion of carbon from the insert into the surrounding steel matrix during the casting process, the second high temperature metal layer protects the first copper layer of metal, the surface of the high temperature layer partially melts at the temperature of the molten steel matrix, the steel matrix is thereby metallurgically bonded to the second high temperature layer.

4,907,666

INTEGRAL EXHAUST PIPE AND BRACKET FOR TRUCKS

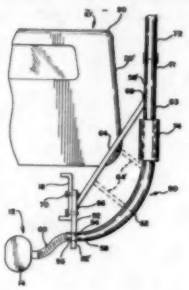
Thomas C. Tecco, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Oct. 18, 1988, Ser. No. 259,062

Int. Cl.[4] B60K *13/06*

U.S. Cl. 180—89.2 26 Claims

3. In an exhaust system for trucks having a cab and a structural framework including a frame, the exhaust system further including a muffler, an exhaust pipe arranged to be coupled to the muffler, a mounting assembly for mounting said exhaust pipe to the structural framework in coupled condition with the muffler comprising an elongate hollow integral exhaust pipe having opposite open ends and an intermediate curved portion, a generally planar mounting plate, means for fixedly securing said mounting plate to said structural framework, one of said exhaust pipe ends being fixedly secured to said plate, and means communicatively coupling said one end of said pipe to



the muffler, the other of said pipe ends opening freely and a brace member having one end fixedly secured to said plate and an opposite end fixedly secured to said pipe.

4,907,667

FULL-TURN TYPE WORKING MACHINE

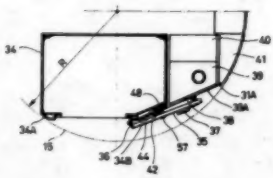
Nobuyoshi Yamamoto, Tsuchiurashi; Yasuhiko Murata, Ushiku; Fumimasa Saeki, Tsuchiura, and Hirosige Kurosaka, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,862

Claims priority, application Japan, Oct. 9, 1987, 62-155396[U]; Aug. 31, 1988, 63-217538

Int. Cl.[4] E02F *3/32*

U.S. Cl. 180—89.13 1 Claim



1. A full-turn type working machine including a lower travelling body, and an upper rotary body swivellably mounted on said lower travelling body, said upper rotary body having a machine room in the right side thereon, an operator's cabin in the front left portion thereon, a counterweight in the rear portion thereon and a fuel tank along the rear side of the operator's cabin and along the front side of the counterweight thereon, an arcuate shaped reinforcing member located against the rear side of the counterweight which defines the outer boundary of a radius R wherein said machine room, operator's cabin, counterweight and fuel tank are located within a circle of a predetermined rotational radius R, wherein said working machine comprises:

a door swingably fitted in an opening on the left side of the operator's cabin and openable rearward toward said counterweight through an angle greater than 180 degrees,

a chamfered portion located in a left rear portion of the operator's cabin permitting said door to be opened substantially rearward in order to receive an outer free end of the door within the boundaries of said circle of rotational radius R in a fully opened state,

a chamfered portion in a left portion of the fuel tank having an angle conforming with the chamfered portion of the operator's cabin and permitting said door, when opened

rearward, to lie against said chamfered portion of said fuel tank and to be received within said circle of rotational radius R.

4,907,668

STEERING TORQUE DETECTING APPARATUS

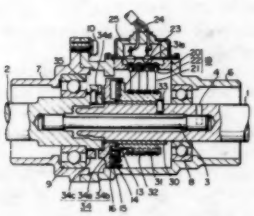
Masayoshi Onishi; Hisato Umemaru, and Hiromasa Ozawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,682

Claims priority, application Japan, Feb. 25, 1988, 63-45076; Feb. 25, 1988, 63-45080; Feb. 25, 1988, 63-45081; Feb. 25, 1988, 63-45082

Int. Cl.[4] B62D 5/04

U.S. Cl. 180—142 11 Claims



1. A steering torque detecting apparatus comprising:

a pair of input and output shafts which constitute in combination a steering shaft;

a torsion bar coupling together said input and output shafts;

a printed board provided with a resistance layer an electrodes, which constitute in combination a potentiometer element, said printed board being mounted on either one of said input and output shafts;

means disposed between one of said shafts and a stationary part for taking out a detection signal from said printed board to said stationary part;

a mounting ring made of an insulating material which is rotated together with the other shaft as one unit;

a slider secured to the inner end face of a flange portion of said mounting ring and held in resilient contact at the distal end thereof with the resistance layer of said potentiometer element, said slider being allowed to slide through a very short distance in the circumferential direction; and

said mounting ring being molded from a synthetic resin material and having a boss portion concentrically supported on said first shaft, a flange portion extending radially outward from said boss portion and having said slider secured to the inner end face thereof, and a cylindrical projecting portion extending axially from the outer end of said flange portion, said projecting portion being formed so as to be elastically compressible and fixed to said second shaft by fixing means so that said projecting portion is prevented from moving circumferentially relative to said second shaft, said cylindrical projecting portion being elastically retained in a compressed state on said second shaft, thereby enabling the end of said boss portion to be brought into contact with said printed board under pressure.

4,907,669

FRONT AXLE FOR AN ALL-WHEEL DRIVE VEHICLE

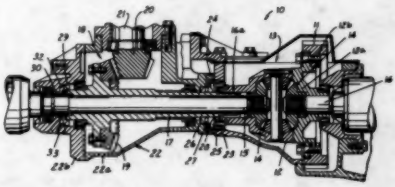
Dugald Cameron, Grosse Pointe Woods, Mich., and Karl Friedrich, Leibnitz, Austria, assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 2, 1988, Ser. No. 266,434

Claims priority, application Austria, Dec. 15, 1987, 3297/87

Int. Cl.[4] B60K 17/34

U.S. Cl. 180—248 2 Claims



1. In a front axle drive for an all-wheel drive motor vehicle, comprising:

first and second wheel drive shafts;

an axle differential coupled to said wheel drive shafts having an input member consisting of a differential housing;

an angle drive having input and output bevel gears;

interaxle drive means non-rotatably connected to said output bevel gear;

a tubular shaft surrounding said first wheel drive shaft and non-rotatably connecting said differential housing to said input bevel gear;

a transmission outer housing containing said differential housing; and

an angle drive housing containing said angle drive and secured to said transmission outer housing by a flanged joint on a first side of said angle drive housing, the improvement comprising;

said transmission outer housing and said angle drive housing being sealed against said tubular shaft adjacent to said flanged joint by first and second oil seals, respectively, said first and second seals being axially spaced apart so as to define therebetween a first interseal chamber;

said tubular shaft and said first wheel drive shaft extending through said angle drive housing to a second side thereof opposite to said first side;

said angle drive housing being sealed on said second side against said tubular shaft by a third oil seal, and said angle drive housing being sealed on said second side against said first wheel drive shaft by a fourth oil seal;

a fifth oil seal disposed between said tubular shaft and said first wheel shaft on said second side of said angle drive housing;

said fourth and fifth oil seals being axially spaced apart so as to define therebetween a second interseal chamber; and

means provided which define first and second drain passages which communicate with and extend outwardly and downwardly from said first and second interseal chambers, respectively.

4,907,670

SEISMIC EXPLORATION USING COMPRESSIONAL AND SHEAR WAVES SIMULTANEOUSLY

Nigel A. Anstey, 19 Coolidge Rd., Winchester, Mass. 01890

Filed Jan. 7, 1982, Ser. No. 337,750

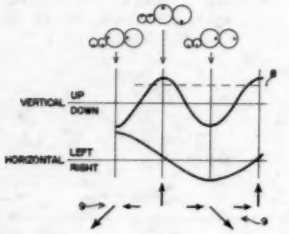
Claims priority, application United Kingdom, Jan. 20, 1981, 8101575; Jan. 20, 1981, 8101576

Int. Cl.[4] G01V 1/04; H04R 11/00

U.S. Cl. 181—121 7 Claims

1. In the technique of seismic exploration using swept-frequency compressional waves and swept-frequency horizontally-polarized shear waves, the improved method in which the

said compressional waves and shear waves are emitted simultaneously from vertical and horizontal vibrators coupled to a single baseplate; in which the frequency of the horizontal vibrator is one-half that of the vertical vibrator; and in which



the relative phase of the vertical and horizontal vibrators is arranged so that the maxima of the horizontal forces generated by the horizontal vibrator occur at the time of the maxima of the downward vertical forces generated by the vertical vibrator.

4,907,671

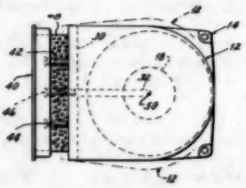
WIDE DISPERSION REFLECTOR

Robert J. Wiley, Wichita, Kans., assignor to Unique Musical Products, Inc., Effingham, Ill.

Filed Apr. 8, 1988, Ser. No. 179,491

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—156 **28 Claims**



1. A reflector for distributing audio waves in a substantially 180 degree dispersal pattern from a diaphragm speaker propagating the audio waves along a substantially single axis into a listening area comprising:

a flat back wall substantially parallel to and laterally spaced from said axis;

a reflecting surface from which said audio waves reflect directly into said listening area connected to said back wall, said reflecting surface having a leading edge connected to said back wall near said speaker, said leading edge approximately intersecting said axis; and

a trailing edge connected to said back wall and said reflecting surface, said trailing edge encompassing an area greater than an area of said speaker.

4,907,672

TRANSMISSION FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Marco F. Muzzarelli, Florence, Italy, assignor to I.De.A. S.p.A. Institute Of Development In Automotive Engineering, Italy

Filed Mar. 9, 1988, Ser. No. 165,784

Claims priority, application Italy, Mar. 10, 1987, 67174 A/87

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—233 **6 Claims**

1. A transmission for a four wheel drive motor vehicle, between the engine and the front wheels and rear wheels, each of said front wheels and rear wheels being driven through half-shafts, comprising:

(a) a first differential device connected to a drive shaft of the engine;

(b) a rear shaft connected with the first differential device;

(c) a second differential device which connects the first differential device to half-shafts of the front wheels for transmitting drive to front wheels of the vehicle;

(d) a third differential device which connects the rear shaft to half-shafts of the rear wheels for transmitting drive to the rear wheels of the vehicle;

(e) each of said first, second and third differential devices being of a limited slip TORSEN type, each said differential device including:

(i) two worm gears, and

(ii) a drive train connecting the two worm gears, said drive train including:

(A) at least one pair of helical gear wheels, each pair of helical gear wheels including a first helical gear wheel in meshing engagement with one of said worm gears and a second helical gear wheel in meshing engagement with the other of said worm gears, and

(B) at least one pair of spur gear wheels, each pair of spur gear wheels including a first spur gear wheel fixed to the first helical gear wheel of a respective pair of helical gear wheels and a second spur gear wheel fixed to the second helical gear wheel of the respective pair of helical gear wheels, the first and second spur gear wheels of each pair of spur gear wheels being in meshing engagement with each other.

4,907,673

STERN PLATFORM LADDER

L. James Ginter, and K. Thomas Kurz, both of Green Bay, Wis., assignors to Cruisers, Incorporated, Oconto, Wis.

Filed Jul. 12, 1989, Ser. No. 378,644

Int. Cl.[4] B63B *29/20*; **E06C** *5/04*

U.S. Cl. 182—81 **7 Claims**

1. A swim platform ladder for a boat, comprising:

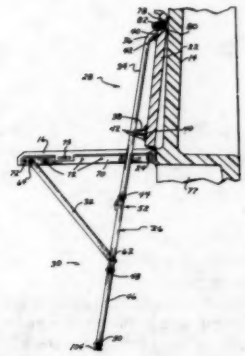
a panel adapted to fit in an opening in a swim platform of a boat, said panel having a top side and an underside;

first hinge means for mounting the panel to the boat to pivot about a horizontal axis between a closed position in which the panel is generally horizontal and in the plane of the swim platform and an open position in which the panel is generally vertical and above the plane of the swim platform;

an upper ladder portion fixed to the underside of the panel so as to pivot about the first hinge means axis with the platform, said upper ladder portion having hand rails extending above the swim platform in the open position;

a lower ladder portion below the upper ladder portion in the open position, said lower ladder portion having at least one rung;

second hinge means for providing a joint between the upper



ladder portion and the lower ladder portion for pivoting said portions relative to one another about a horizontal axis which is parallel to the first hinge means axis;

at least one control link having two ends;

third hinge means for pivotally connecting one end of each control link to the boat to rotate about a horizontal axis which is parallel to the first hinge means axis;

fourth hinge means for pivotally connecting the other end of each control link to the lower ladder portion for rotation about a horizontal axis which is parallel to the first hinge means axis;

locking means for securing the panel in the open position; and

wherein moving the panel into the open position deploys the ladder to extend downwardly beneath the platform and moving the panel into the closed position folds the ladder to stow it, under the panel.

4,907,674

RESCUE PLATFORM

Myron F. Miller, 8141 Campbell St. #112, Kansas City, Mo. 64131

Filed Jun. 30, 1988, Ser. No. 213,679

Int. Cl.[4] B62B *5/02*; E04G *3/08*

U.S. Cl. 182—150 **6 Claims**

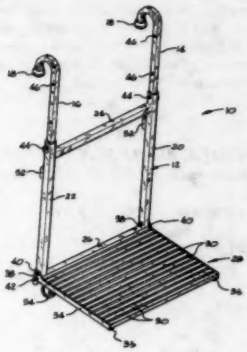
1. An emergency rescue platform for use in deep water for spinal injury victims comprising:

a support frame including two side rails having upper and lower ends and at least two lateral sections;

a platform means hingedly attached at one side thereof to the support frame allowing the platform to rotate from a stored position, parallel to the frame, to its use position normal to the frame;

a pair of adjustable length hanger arms with hook-shaped ends for engaging a pool surface, each arm telescopingly received within a frame side rail;

locking means on the side rails for holding the platform's load in its use position; and



a support means attached to the support frame for contact with the pool wall.

4,907,675

MODULAR CONSTRUCTIONAL ELEMENT IN PARTICULAR OF A LADDER OR SCAFFOLDING

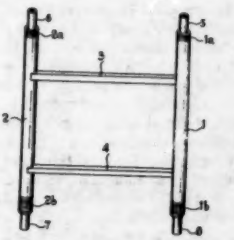
Gérard Saby, Hameau d'Auffray - Oherville 76560, Doudeville, and Frédéric Lemercier, Résidence Ecureuil - 11 rue d'Arques, 76190 Yvetot, both of France

Filed Jun. 10, 1988, Ser. No. 205,248

Claims priority, application France, Jun. 11, 1987, 87 08153; Feb. 9, 1988, 88 01529

Int. Cl.[4] E06C *1/10, 1/18*

U.S. Cl. 182—178 **25 Claims**



1. A single ladder comprising at least two axially adjacent modular elements;

an upper element of said elements comprising two spaced-apart uprights, at least one crosspiece extending between and interconnecting the uprights, the uprights having at least a lower screw-threaded end;

a lower element of said two elements comprising two spaced-apart uprights, at least one crosspiece extending between and interconnecting the uprights of said lower element, the uprights of said lower element having upper screw-threaded ends;

at least two tapped fixing rings screw-threadedly engaged on the lower screw-threaded ends of the two uprights of said upper element and screw-threaded engaged on the upper screw-threaded ends of said lower element and thereby coupling together the uprights of said upper element and said lower element; and

foot means mounted on lower ends of the uprights of said lower element; and

wherein said foot means comprise a support bar having two openings, two bolts extending through said openings,

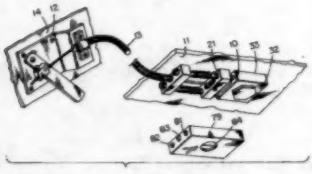
means defining tapped cavities provided at lower ends of the uprights of said lower element, the bolts being screw-threadedly engaged in said cavities for fixing the bar to said lower element, a tapped sleeve provided at each end of the bar, and a screw-threaded rod, screw-threadedly engaged in said tapped sleeve and a support shoe provided at a lower end of each rod for adapting the foot means to the configuration of the ground.

4,907,676

LOW PROFILE, REMOTELY OPERABLE VALVE

Hossain A. Shirdavani, 14425 NE. 37th Pl., Bellevue, Wash. 98007

Filed Apr. 3, 1989, Ser. No. 332,596
Int. Cl.[4] E01M *11/04*
U.S. Cl. 184—1.5 **1 Claim**



1. A remotely operable valve attachable to an internally threaded fitting, said valve comprising:

a body having two parallel, planar faces and at least one side, a cavity, a port in said at least one side opening into said cavity and a cylindrical hole through said body and said cavity, said hole having a first diameter and an axis perpendicular to said two planar faces, said body further having two threaded holes extending into it and having parallel axes essentially parallel to said planar faces, said threaded holes being adjacent to said port,

two bolts having heads, shanks and threaded ends, said threaded ends being threaded into said threaded holes whereby said shanks are parallel to each other,

a header piece having first and second holes, sized and oriented whereby said header piece is installable on and is installed on said shanks adjacent to said heads,

a slider having a slider face and third and fourth holes sized and oriented perpendicular to said slider face and whereby said slider is installable on and is installed on said shanks with said slider face facing said port,

two compression springs, installed one on each of said shanks of of said two bolts between said header piece and said slider, whereby said springs apply forces to move said slider toward said body,

a seal installed on said slider face whereby when said slider face is moved toward said body by said springs said seal closes said port,

apparatus for moving said slider,

features in said header piece and said slider for attaching said apparatus to move said seal away from said port against said forces applied by said springs, whereby said valve is opened, and to allow said forces applied by said springs to move said seal against said port, whereby said valve is closed,

an attachment fitting having a head, a cylindrical shank, a threaded end, a bore in said shank, said cylindrical shank having an outer surface and a second diameter such that said cylindrical shank fits in said cylindrical hole through said body, said fitting having at least one passage between said outer surface and said bore,

first and second ring shaped gaskets,

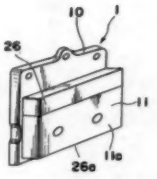
whereby with said attachment fitting inserted through said hole through said body with said first gasket between said head of said attachment fitting and one of said two planar parallel faces and said second gasket against the other of said two planar parallel faces and said threaded end of said attachment fitting threaded into said internally threaded fitting, said valve is attached to said internally threaded fitting.

4,907,677

FRICTION BRAKE MATERIAL WITH CARBON AND FERROUS PORTIONS

Yukinori Yamashita; Kouichi Iwata, and Seigou Sakagami, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 25, 1988, Ser. No. 147,865
Claims priority, application Japan, Mar. 31, 1986, 61-74635
Int. Cl.[4] F16D *65/00, 65/10, 69/00*
U.S. Cl. 188—73.1 **7 Claims**



1. A friction brake comprising:

a friction element; and

a counter-friction element frictionally engageable with the friction element, one of the friction and counter-friction elements being made of carbon material and comprising one of a friction pad or brake disk while the other of the friction and counter-friction elements comprises the other of the friction pad or the brake disk and comprises at least first and second portions both engageable simultaneously with said one of the friction and counter-friction elements during a braking operation, said first portion of such other of the friction and counter-friction elements being made of the same carbon material and the second portion thereof being made of ferrous material, whereby the ferrous material contacts the carbon material of said one of the friction and counter-friction elements during the braking operation.

4,907,678

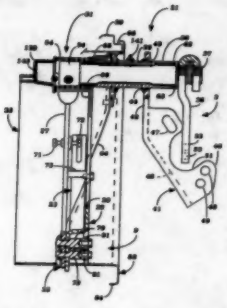
AIR CHAMBER MOUNTING BRACKET

John A. Urban, Plainwell, Mich., assignor to Lucas Industries Public Limited Company, Birmingham, United Kingdom

Filed Dec. 15, 1987, Ser. No. 133,006
Int. Cl.[4] F16D *51/00*; B60T *11/00*; A47F *5/00*
U.S. Cl. 188—78 **8 Claims**

1. A mounting arrangement for a power unit of a drum brake having backing plate fixed relative to an associated drum rotatable about a rotational axis, a pair of brake shoes supported for movement relative to said backing plate from a retracted position to an engaged position within the associated brake drum, cam means for actuating said brake shoes comprising a camshaft supported for rotation about an axis offset from said rotational axis, an actuating lever affixed to said camshaft for rotating said camshaft and actuating said brake shoes, a mounting bracket affixed to said backing plate in proximity to said lever, said mounting bracket comprising first and second angularly related planar elements and a third planar element integral with the perpendicular to both elements, said third element extending from and end region of said second element to a point beyond the junction between all of said elements, said

third element being inclined with respect to said rotational axis and providing attachment means for attaching the power unit



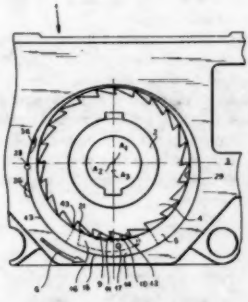
to said bracket said first element forming an opening for securing said mounting bracket to said backing plate.

4,907,679

CATCH DEVICE FOR A ROLL-UP DOOR, GRATE, GRILL OR THE LIKE

Wilhelm Menke, Annettestrasse 6, 4425 Billerbeck, Fed. Rep. of Germany

Filed Jan. 10, 1989, Ser. No. 295,412
Int. Cl.[4] B60T *7/12*
U.S. Cl. 188—189 **15 Claims**



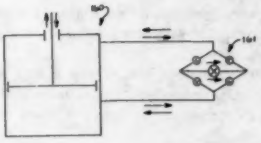
1. A catch device for a rotatable member, comprising:
a housing;
a shaft rotatable relative to said housing with said member;
a brake wheel mounted on said shaft in said housing and formed with a peripheral array of equispaced sawtooth formations regularly distributed around an outer circumference of said brake wheel;
a clamping ring surrounding said brake wheel and formed with a peripheral annular surface juxtaposed with a peripheral annular surface of said housing, at least one of said surfaces being eccentric with respect to an axis of rotation of said brake wheel and said shaft, whereby angular displacement of said clamping ring with said brake wheel brings said surfaces into clamping engagement, said brake wheel being rotatable in and relative to said clamping ring; and
a swingably mounted pawl normally clearing said formations to permit rotation of said brake wheel relative to said clamping ring at normal rotary speeds of said brake wheel, and entrainingly engageable with one of said sawtooth formations of said brake wheel upon development of an excessive rotary speed of said brake wheel to angularly entrain said clamping ring with said brake wheel and bring said surfaces into clamping engagement to brake said brake wheel.

4,907,680

SEMI-ACTIVE DAMPER PISTON VALVE ASSEMBLY

Paul T. Wolfe, Apex; Charles M. Nobles, Fuquay-Varina, and Lane R. Miller, Cary, all of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Jan. 29, 1988, Ser. No. 150,112
Int. Cl.[4] F16F *9/46*
U.S. Cl. 188—299 **5 Claims**



1. A damping system for attenuation of motion between spaced members providing a controllable damper force operative independently of the motion condition of the damper, having a cylinder containing a damping fluid, and a piston slideably disposed within the cylinder in response to relative motion between the spaced members and dividing the cylinder into opposing fluid chambers, the improvement comprising:
flow passages through said piston having openings thereof in communication with each of said opposing chambers and having orthogonal portions thereof interiorly positioned within said piston for permitting regulated flow of fluid therethrough between said opposing chambers;
a slider within said piston having a moving coil portion and a valve element portion operably interconnected and axially reciprocative relative to a permanent magnetic field within said piston between a first position and a second position dependent upon the direction of electric current passing through said moving coil;
wherein in said first position flow of fluid between said opposing chambers is substantially unrestricted through said flow passages and in said second position said valve element intersects said orthogonal portions of said flow passages to substantially restrict flow of fluid therethrough, said slider being axially reciprocative between said first and second positions independently of the fluid pressure differential between said opposing chambers;
said flow passages including unidirectional flow means for flow of fluid radially outwardly from the central axis of said piston through said orthogonal portions and across said valve element during flow in both compression and extension of said piston.

4,907,681

PARK LOCKING MECHANISM FOR AN AUTOMATIC TRANSMISSION

Uno Kuusik, Royal Oak, and Ronald J. Plotzke, Mt. Clemens, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,613
Int. Cl.[4] B60T *1/06*; F16D *41/26*
U.S. Cl. 192—4 A **2 Claims**

1. A vehicle transmission park lock mechanism for anchoring a transmission power output member to a transmission housing comprising:
a gear member carried by and rotatable with a transmission power output member and having external teeth;
a parking pawl member mounted to a transmission housing for pivotal movement about a first axis, said parking pawl member having a male portion adapted to engage a recess

between adjacent teeth of said gear member in a first position;

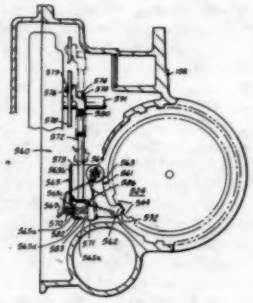
spring biasing means biasing said parking pawl member away from said gear member to disengage the recess between adjacent teeth of said gear member in a second position;

an actuator assembly for pivotally moving said parking pawl member between said first and second positions; and

guide bracket means mounted to the transmission housing and adapted to receive said parking pawl member for operatively cooperating with said actuator assembly to pivotally move said parking pawl member between said first and second positions;

a plate member mounted for pivotal movement on a second axis orthoganal to said first axis for actuating said actuator assembly;

said actuator assembly comprising a rod member, a U-shaped carrier formed with parallel side flanges fixed at one end of said rod member, the other end of said rod



member being pivotally connected to said plate member, a pair of parallel pins extending between and fixed to said side flanges, said carrier having a pair of cam rollers each formed with a central bore, said bore receiving a corresponding one of said pins therethrough, the diameter of said bore being greater than the diameter of said pin such that each said roller is free for predetermined limited transverse movement relative to its associated pin so as to rollingly engage the other roller;

said guide bracket means comprising a guide bracket having a pair of side walls interconnected by a bracket wall, said side walls located in parallel planes; and

said bracket wall having a main portion and an offset portion interconnected by an oblique portion, said carrier adapted to be moved between said side walls by the actuation of said rod member as said plate member is rotated such that one of said rollers successively contacts said main portion, said oblique portion, and said offset portion of said bracket wall to move said parking pawl member.

4,907,682

VISCOUS FLUID COUPLING DEVICE

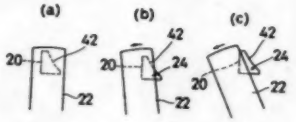
Masaharu Hayashi, Toyota, and Seiya Tanaka, Bisai, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 122,687, Nov. 18, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,671

Claims priority, application Japan, Nov. 21, 1986, 61-179534[U]

Int. Cl.[4] F16D *35/00, 43/25*

U.S. Cl. 192—58 B **3 Claims**



1. A viscous fluid coupling device comprising:

an input shaft equipped with a rotor,

an output member equipped with an internal chamber for housing viscous fluid and the rotor,

a partition wall dividing said internal chamber into an operating chamber for said rotor and a reservoir chamber for viscous fluid and having a slot as a passageway for supplying viscous fluid from said reservoir chamber to said operating chamber,

a pump mechanism for sending said viscous fluid with pressure from said operating chamber to said reservoir chamber,

a non-perforate valve member for controlling an opening and closing of said slot, and

a temperature sensitive member for sensing an air temperature surrounding said viscous fluid coupling device and for moving said valve member to rotate in response to an increase of said temperature, wherein said slot consists of first through fourth interconnected, straight sides and a fifth side comprising a continuously arcuate concave edge, so that an increased rate of said opening area of said slot is smaller in a low temperature region than in a high temperature region.

4,907,683

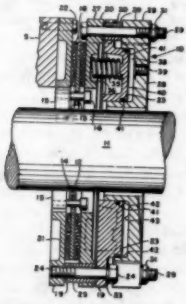
DISC BRAKE OR CLUTCH

Kirit R. Patel, North Royalton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 29, 1988, Ser. No. 237,792

Int. Cl.[4] F16D *25/06*

U.S. Cl. 192—85 AA **6 Claims**



1. A spring applied coupling device comprising:

a relatively rotatable input shaft rotatable about an axis of rotation:

a radially outwardly extending rotor disc including inner and outer peripheral surfaces and means for mounting said disc for rotation with said input shaft;

a first annular axially fixed reaction member adjacent one side of said rotor disc;

a second annular axially fixed reaction member positioned on the opposite side of said rotor disc;

a plurality of first connecting means for connecting said first and second axially fixed reaction members in fixed axially-spaced relationship, all of said plurality of connecting means extending axially and positioned radially outwardly from said outer peripheral surface of said rotor disc;

a first annular axially movable reaction member positioned between said opposite side of said rotor disc and said second axially fixed reaction member;

a second relatively movable annular reaction member;

a plurality of second connecting means for connecting said first and second movable reaction members to each other a fixed axial distance apart, all of said plurality of connecting means extending axially and positioned radially outwardly from said outer peripheral surface of said rotor disc;

an annular disc of friction material secured between each radially extending side of said rotor disc and said first fixed and said first movable reaction members;

spring means between said first axially movable reaction member and said second relatively fixed reaction member for biasing said movable reaction member into frictional engagement with said disc;

a second fixed reaction member and second movable reaction member forming an annular pressure chamber which when pressurized causes said movable members to move axially away from said rotor disc to compress said spring means and disengage said first annular annular axially movable reaction member from said disc.

4,907,684

BALL DRAIN VALVE FOR THE PISTON SPACE OF A ROTARY MULTI-DISC CLUTCH

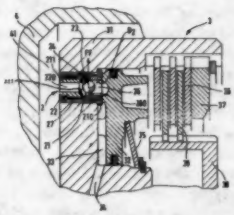
Harald Breisch, Kressbronn, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 324,203

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808865

Int. Cl.[4] F16D *25/14*

U.S. Cl. 192—106 F **9 Claims**



1. A ball drain valve **(2)**, for a piston space **(33)** of a rotary multi-disc clutch **(3)** which includes a piston **(32)**, to release the piston **(32)** from pressure generated by rotation of pressurized oil remaining in the piston space **(33)** when bled, comprising a housing **(21)**, an opening **(220)** and a valve ball **(23)** actuated by centrifugal force and oil pressure, said valve ball **(23)** being disposed in interconnected ball spaces **(25, 26)** of different diameters **(D1, D2)**, and the space occupied by said valve ball **(23)** being determined by the axial position of said piston **(32)** relative to the valve **(2)**, wherein said valve ball **(23)** occupies the ball space **(25)** of relatively large diameter **(D1)** when said multi-disc clutch **(3)** is engaged and said ball drain valve **(2)** is closed and said valve ball **(23)** occupies the ball space **(26)** of relatively small diameter **(D2)** when said multi-disc clutch **(3)** is disengaged and said ball drain valve **(2)** is open.

4,907,685

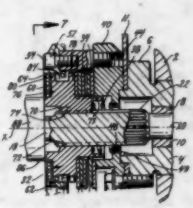
CLUTCH FOR AUTOMOTIVE VEHICLES

Gary A. Landolt, P.O. Box 377, 112 W. Main St., Grafton, Ill. 62037

Filed Jan. 30, 1989, Ser. No. 302,956

Int. Cl.[4] F16D *47/00*

U.S. Cl. 192—485 **21 Claims**



16. A clutch for connecting members that are capable of rotating about a common axis of rotation, said clutch comprising: a first member located along the axis; a second member also located along the axis and being movable axially with respect to the first member between a disengaged position and first and second engaged positions; one of the members having cutouts arranged in a circumferential row around the axis and the other member having lugs arranged in a circumferential row around the axis, the lugs fitting into the cutouts when the second member is in its first engaged position to interlock the first and second members so that they rotate together, the member having the cutouts further having lips which extend over at least some of the cutouts to prevent the lugs on the other member from passing axially through the cutouts; and first and second friction surfaces carried by the first and second members, respectively, such that they do not rotate with respect to the members on which they are carried, the first and second friction surfaces being positioned such that they will slip relative to each other when the second member is in its disengaged position, the first and second friction surfaces firmly abutting when the second member is in its second engaged position so that torque will be transferred from one member to the other member at the abutting friction surfaces.

17. A clutch for connecting machine components that are capable of rotating about a common axis of rotation, said clutch comprising: a first member located along the axis; a second member also located along the axis and being movable axially with respect to the first member between a disengaged position and first and second engaged positions; one of the members having cutouts arranged in at least two circumferential rows around the axis with a space between the rows, the other member having lugs arranged in at least two circumferential rows around the axis, the lugs fitting into the cutouts when the second member is in its first engaged position so that the first and second members are interlocked and hence rotate together, the rows of lugs being removed from the rows of cutouts with one row of lugs being in the space between the rows of cutouts when the second member is in its disengaged position; and first and second friction surfaces carried by the first and second members, respectively, such that they do not rotate with respect to the members on which they are carried, the first and second friction surfaces being positioned such that they will slip relative to each other when the second member is in its disengaged position, the first and second friction surfaces firmly abutting when the second member is in its second

engaged position so that torque will be transferred from one member to the other member at the abutting friction surfaces.

4,907,686

AUTOMATIC HIGH SPEED TIE PLATE REORIENTING MECHANISM

Dennis J. Cotic, Waukesha, Wis., assignor to Oak Industries, Inc., San Diego, Calif.

Filed Jul. 26, 1988, Ser. No. 224,486
Int. Cl.[4] B65G 11/20
U.S. Cl. 193—45 31 Claims

1. A mechanism for inverting the sensed orientation of a conveyed article having a detectable top and bottom in a sequential arrangement of such articles, comprising:

an inclined slide surface having an upper end and a lower end and adapted to receive the conveyed article at said upper end for descending travel thereupon;

stop means pivotally and reciprocally associated with said surface and adapted to intercept the descent of the conveyed article upon said surface toward said lower end, said stop means having a vertically extended position for contacting a front end of the article; and

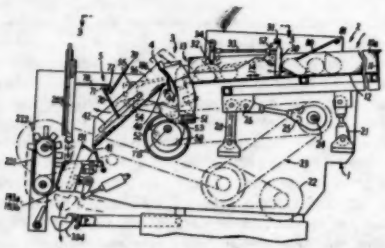
flipper means pivotally and reciprocally associated with said surface and adapted to extend vertically to impact a rear end of the stopped article with sufficient force to rapidly flip the article past said stop means and toward said lower end of said slide surface, thus inverting the orientation of the article upon said surface.

4,907,687

PEAR ORIENTING APPARATUS

Konrad Meissner, Lafayette, and Marvin F. Quay, Concord, both of Calif., assignors to Atlas Pacific Engineering Company, Pueblo, Colo.

Division of Ser. No. 398,065, Jul. 14, 1982, Pat. No. 4,487,307. This application Sep. 17, 1984, Ser. No. 650,695
Int. Cl.[4] B65G 47/24
U.S. Cl. 198—394 2 Claims



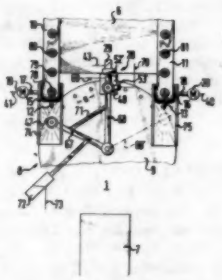
1. In a pear orienting apparatus having at least one generally V-shaped inclined delivery chute with a lower discharge end, means for enhancing orientation of parts exiting from the chute with the stem-end lowermost comprising an indexible chute stop gate overlying the discharge end of the chute to arrest the pear slide in the chute and having at least one finger intermittently movable down the chute with stiffness against deflection in the downward direction and flexibility in the other direction; and means for intermittently opening the chute stop gate to permit further pear slide in the chute.

4,907,688

DEVICE FOR THE TRANSFER OF BOBBINS FROM A CONVEYOR BELT WITH A LARGE LOADING CAPACITY TO A BOBBIN CONVEYOR WITH A SMALL LOADING CAPACITY

Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Münchengladbach, Fed. Rep. of Germany

Division of Ser. No. 907,066, Sep. 12, 1986, abandoned. This application Jul. 18, 1988, Ser. No. 220,916
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532915
Int. Cl.[4] B65G 47/04
U.S. Cl. 198—463.4 15 Claims



1. Assembly for the orderly and sequentially timed transport of bobbins, comprising a bobbin producing machine, first and second conveyor belts with a given load capacity and a given bobbin carrying capacity downstream of said bobbin producing machine in a bobbin travel direction, a switching device for switching said conveyor belts on and off, a controllable individual bobbin retaining device downstream of said conveyor belts including a bobbin retaining element, said bobbin retaining device being movable between a bobbin receiving position in the vicinity of at least one of said first and second conveyor belts and a bobbin delivery position, a bobbin transporter downstream of said bobbin retaining device with a load capacity and bobbin carrying capacity being smaller than said given load and bobbin carrying capacities, said bobbin transporter including receiving means for individual bobbins, means for operating said bobbin transporter in step with said conveyor belts, said operating means including a bobbin presence sensor causing said bobbin transporter to advance if a bobbin is present and causing said retaining element to open if a bobbin is not present at a given location on said bobbin transporter, said bobbin retaining device being in the form of a loading chute into which said conveyor belts deliver bobbins in sequence one after the other, and said bobbin transporter including a bobbin centralizing sleeve below said bobbin retaining device, said bobbin delivery position being disposed above said bobbin centralizing sleeve.

4,907,689

APPARATUS FOR TRANSPORTING REELS OF PACKAGING MATERIAL IN A PACKAGING MACHINE PLANT

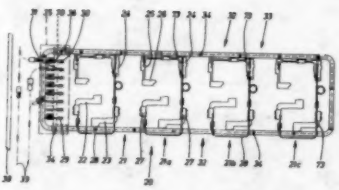
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 99,964

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1986, 3632237

Int. Cl.[4] B65G *17/48*

U.S. Cl. 198—487.1 **23 Claims**



1. Apparatus for transporting reels of packing material, from a stock to at least one processing machine, comprising

at least one loading station for loading reels onto a carrying means;

at least one unloading station for unloading said reels from said carrying means;

at least one circular conveyor arranged above said at least one processing machine and provided with a plurality of said carrying means for carrying said reels of packing material in a carrying direction;

each of said carrying means being provided with an horizontally extending supporting journal for introducing a freely accessible end thereof into a central orifice of a reel during a loading procedure in said loading station and for supporting a loaded reel during carrying of said reel;

bearing means for rotatably supporting said supporting journal about a vertical axis; motor means carried by said carring means for rotating said supporting journal about said vertical axis, and comprising means for controlling the rotational position of said supporting journal and for rotating said supporting journal in a direction in which said end of said supporting journal points to a direction opposite to said carrying direction when said carrying means approaches said unloading station; and

strip-off means, provided in said unloading station, for contacting said reels, and for stripping said reel off from said supporting journal.

4,907,690

DEVICE FOR REMOVING A COMPACTED OIL SAND LAYER FROM A CONVEYOR BELT

Lawrence M. Spohn, Fort McMurray, Canada, assignor to Alberta Energy Company, Ltd. et al., Calgary, Canada

Filed Aug. 19, 1988, Ser. No. 233,737

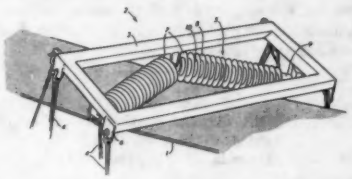
Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—498 **1 Claim**

1. A device for shearing an adherent layer of oil sand for removal from a major surface of a moving conveyor belt having upstream and downstream ends comprising:

a frame;

a pair of linear arrays of spaced apart, rotatable, metal discs arranged in a v-shaped formation with the apex of the formation being positioned substantially at the centre of the belt, said discs being generally dish-shaped and having their concave faces directed toward the upstream end of said belt; and



means, associated with said frame, for suspending said frame and bringing the discs into pressing engagement with the oil sand layer at the desired contact pressure.

4,907,691

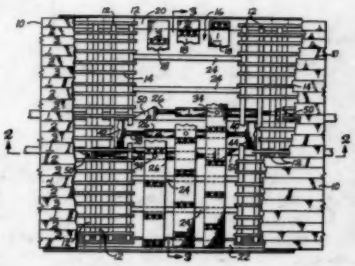
RECIPROCATING FLOOR CONVEYOR WITH SNAP-ON FLOOR MEMBERS

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Continuation of Ser. No. 68,932, Jul. 1, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 265,332

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—750 **14 Claims**



1. A reciprocating floor conveyor, comprising:

a plurality of floor members each having a top;

a support and guide means for each floor member on which the floor member is supported for back and forth longitudinal travel;

drive means for moving the floor members in one direction for advancing a load, and for retracting the floor members in the opposite direction; and

a plug-together, slip joint connection between each floor member and the drive means, said connection being accomplished by a vertical plug-together movement of the floor member relative to the drive means and said connection comprising a first connector component that is integral with the floor member and a complementary second connector component that is integral with the drive means, said first and second connector components having engaging load transferring vertical abutting surface portions below the tops of the floor members positioned so that during movement of the drive means both in the load advancing direction and in the floor member returning direction a vertical surface portion of the first connector component contacts and pushes against a confronting vertical surface portion of the second connector component, said abutting surface portions have surface-to-surface contact area wider than their respective vertical depth,

wherein said first and second connector components are positioned for vertical movement together so that each

floor member can be moved downwardly onto its support and guide means with its connector component vertically aligned with the complementary connector component on the drive means, for moving its connector component into connecting engagement with the second connector component, and for positioning the floor member on its support and guide means.

4,907,692

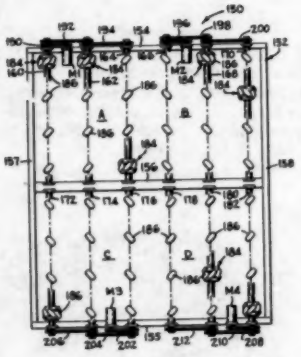
CONTAINER TRANSLATING AND ORIENTING APPARATUS AND METHOD

John W. Sogge, Orlando, Fla., assignor to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 729,442, May 1, 1985, abandoned. This application Sep. 27, 1985, Ser. No. 781,443

Int. Cl.[4] B65G *13/02*

U.S. Cl. 198—780 **12 Claims**



1. An apparatus for selectively moving an article having a flat bottom lying in a support plane in a plurality of different directions, comprising:

means defining a platform having a longitudinal axis and a transverse axis;

means defining a plurality of parallel shafts journaled on said platform and having axis of rotation parallel to said transverse axis of the platform;

a plurality of independently controlled selectively operated power means each operatively connected to at least one of said shaft means;

a plurality of roller mounting means secured to each shaft;

a plurality of evenly space barrel shaped rollers journaled on each roller mounting means and having their axes of rotation disposed helically at an acute angle relative to the axis of rotation of their associated said shaft, said acute angle of said helical rollers mounted on said shaft being reversed relative to the acute angle of the rollers mounted on said at least one other shaft, and

control means for independently and selectively controlling each of said plurality of power means for maintaining said associated at least one shaft stationary or for driving said operatively connected at least one shaft in a selected direction.

4,907,693

CONVERTIBLE SHIPPING CARTON

Jack R. Child, Huntington Beach, Calif., assignor to Paper Corporation of America, Wayne, Pa.

Filed Jun. 13, 1989, Ser. No. 365,377

Int. Cl.[4] B65D *5/52*

U.S. Cl. 206—44 R **11 Claims**

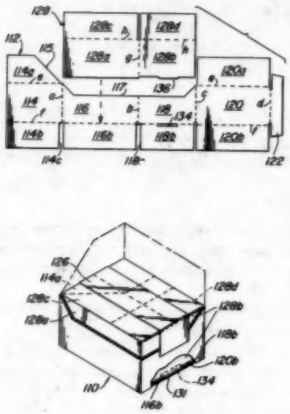
1. A shipping carton suitable for converting into a display bin, comprising, in combination:

first and second pairs of opposed panels connected to form a generally rectangular enclosure;

bottom flaps foldable inwardly from respective bottoms of said first panels and recessed along one side normal to the foldline to form a first slot with the inner surface of one of said second panels;

bottom lids foldable inwardly from respective bottoms of said second panels against the outer surfaces of said bottom flaps for closure of the bottom of the enclosure;

a first top flap foldable inwardly from the top of one of said first panels;



a top lid foldable inwardly from the top of the other of said second panels against the outer surface of said first top flap; and

a removable insert having a first member disposed for facing contiguity with said one of said second panels and for tucking the bottom edge into said first slot, and a second member foldable inwardly from the top of said first member against the outer surface of said first top flap for closure of the top of the enclosure with said top lid;

whereby removing said insert and unfolding said top lid into the plane of the other of said second panels transforms the shipping carton into a display bin.

4,907,694

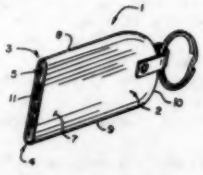
COIN POUCH

Joseph T. Miller, St. Louis County, and Edward F. Brown, St. Francois County, both of Mo., assignors to MOCAP, St. Louis, Mo.

Filed Feb. 9, 1989, Ser. No. 307,920

Int. Cl.[4] A45C *1/02, 11/32*

U.S. Cl. 206—0.81 **4 Claims**



1. A coin pouch including an enclosure member having a

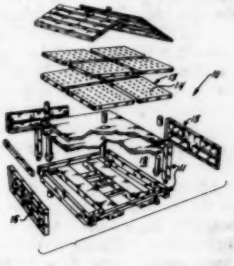
cavity therein, and further having at least one entrance at one end, said enclosure member formed of a polymer material and being sufficiently resilient to allow its compression to attain an opening of its entrance end to achieve deposit or withdrawal of coins from there within, but due to its inherent resiliency allowing the enclosure member, at its entrance, to inherently shift into closure, and a fastening means attaching to the enclosure member at its entrance to temporarily secure it into closure, said enclosure member being formed of a polyvinyl chloride, said polyvinyl chloride having a Shore hardness of between about 70–75, said enclosure member having upper, lower, side and one end wall, all of said walls being integrally formed together to attain a unitary member, said entrance being located at the opposite end of the enclosure member from the said end wall, said fastening means comprising a hook and pile fastening means, said hook and pile fastening means being affixed respectively to the interior of said upper and lower walls proximate said entrance to maintain it in closure when said walls are compressed together, said upper and lower walls being in proximity with each other when said coin pouch is in its uncompressed condition and thereby having a spacing therebetween to provide for the contact and securement together of said hook and pile fastening means to retain the pouch cavity in closure, but that upon compressing of the coin pouch proximate its side walls tending to disconnect the hook and pile fastening means from each other to provide a forced opening to the entrance end of said pouch, said pouch being substantially longer than wider, and a key ring securing to the enclosure member at its end wall.

4,907,695

ROBOTIC PALLET/CONTAINER

Peter F. Gomes, Belle River; Brian W. Schisler, Amherstburg, both of Canada, and Gary L. Mooneyham, Rochester, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 31, 1989, Ser. No. 401,703
Int. Cl.[4] B65D *19/00*
U.S. Cl. 206—386 **14 Claims**



1. A protective positioning pallet for holding each of a plurality of parts in an accurate spatial position, comprising:

(a) a rigid exterior skeleton frame defining a cylindrical space, said frame having positioning surfaces outside of said space for accurately orienting said frame, and locator surfaces extending into said cylindrical space for locating parts therein; and

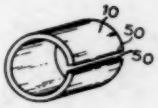
(b) one or more cradles suspended across said locator surfaces in a predetermined fixed position relative to said frame for snugly holding said parts in part-to-part separations.

4,907,696

COLLAPSIBLE CORE ADHESIVE ROLLS

Leonard D. DeCoste, Jr., Stoneham, Mass., assignor to Kendall Company, Lexington, Mass.

Filed Sep. 30, 1988, Ser. No. 252,196
Int. Cl.[4] B65D *85/671, 85/672*
U.S. Cl. 206—411 **8 Claims**



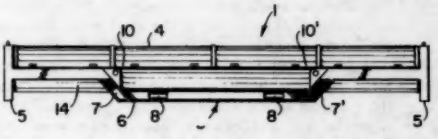
1. An adhesive roll comprising an adhesive tape wound on a semi-rigid generally cylindrical core member of substantially the same width as said adhesive tape, said adhesive tape having been subjected to stress upon winding on said core member and stress recovery at some time thereafter, said core member being initially collapsible and having collapsed upon said stress recovery whereby to inhibit telescoping of said tape on said core member in which overlapping portions of said tape fan out beyond said core member.

4,907,697

CONTAINER FOR TRANSPORTING LONG OBJECTS, ESPECIALLY ROLLS FOR PAPERMAKING MACHINES

Esbjörn Stake, Hudiksvall, and Lennart Magnusson, Iggesund, both of Sweden, assignors to Mecania AB, Hudiksvall, Sweden

PCT No. PCT/SE87/00620, § 371 Date Jul. 6, 1989, § 102(e) Date Jul. 6, 1989, PCT Pub. No. WO88/05414, PCT Pub. Date Jul. 28, 1988
PCT Filed Dec. 21, 1987, Ser. No. 377,853
Claims priority, application Sweden, Jan. 19, 1987, 8700177
Int. Cl.[4] B65D *85/20, 85/66*
U.S. Cl. 206—446 **8 Claims**



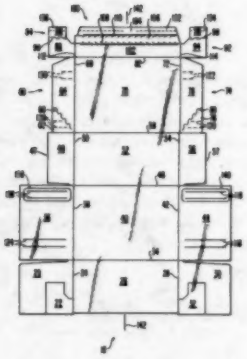
1. A container for transporting long, preferably cylindrical objects (2), especially rolls for papermaking machines, comprising on the one hand an outer supporting rigid metal frame (3) and, on the other hand, a nonsupporting casing (4) protecting the object, characterising in that the frame (3) comprises end frame members (5) at each short end of the container and side frame members (6) arranged along each of the container long sides and connected to said end frame members (5), and that the casing (4) comprises both a preferable semicylindrical continuous bottom part (14) which is suspended in the side frame members (6), and one or more, preferably semicylindrical top parts (15) detachably connected to the bottom part (14), and that there are provided within said casing (4) at least two devices (25) secured to said side frame members and adapted to fix the object (2) in transport position.

4,907,698

ICE CREAM CARTON, CARTON BLANK, AND METHOD OF ASSEMBLY

Kenneth F. Konrad, and E. David Geng, both of Kalamazoo, Mich., assignors to James River Corporation, Richmond, Va.

Filed Mar. 17, 1989, Ser. No. 324,667
Int. Cl.[4] B65D 5/54
U.S. Cl. 206—611 6 Claims



1. A tamper-evident, top-opening carton comprising:

(A) a receptacle portion having opposite ends and including front, bottom, rear, and top panels hingedly connected to each other in the order stated;

(B) means for closing one end of said carton including

a bottom end flap hingedly connected to the bottom panel;

a rear end flap hingedly connected to the rear panel and adhesively connected to the bottom end flap;

a front end flap hingedly connected to the front panel and adhesively connected to the bottom end flap;

a front cover sealing flap, having (1) a front cover skirt hingedly connected to the top panel, (2) a first adhesive tab adhesively connected to the front panel, (3) a tear strip connecting the front cover skirt to the first adhesive tab, and (4) a corner post flap having (a) a corner hood tab hingedly connected to the front cover skirt, (b) a second adhesive tab adhesively connected to the front end flap, and (c) a first severance line connecting the corner hood tab to the second adhesive tab for severing the corner hood tab from the second adhesive tab when a user initially opens the carton;

a top end flap, hingedly connected to the top panel, having an end cover skirt adhesively connected to the corner hood tab, a third adhesive tab adhesively connected to the rear end flap, and a second severance line connecting the end cover skirt to the third adhesive tab for severing the end cover skirt from the third adhesive tab when a user initially opens the carton;

wherein the top panel, the end cover skirt, the front cover skirt, and the corner hood tab form a reclosable cover for the carton, when a user removes the tear strip and severs the end cover skirt from the third adhesive tab and severs the corner hood tab from the second adhesive tab; and

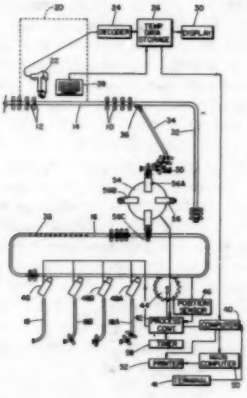
(C) means for closing the other end of the carton.

4,907,699

METHOD AND APPARATUS FOR SORTING RANDOMLY POSITIONED GARMENTS MINIMIZING SERTING CONVEYOR MOVEMENT

R. E. Butcher, and A. A. Henderson, Jr., both of Houston, Tex., assignors to Speed Sort, Inc., Houston, Tex.

Filed Mar. 3, 1989, Ser. No. 318,914
Int. Cl.[4] B07C 3/10
U.S. Cl. 209—3.3 19 Claims



1. A method of sorting and arranging garments in a preselected order each having an identifying marking affixed thereto and suspended from a garment hanger, the garments being in an unordered sequence prior to the sorting and arranging, the method comprising:

(a) sequentially identifying each garment in the unordered sequence from the identifying marking and outputting an identification signal in response thereto;

(b) inputting each identification signal to a data storage device;

(c) sequentially arranging each garment in the identified sequence thereof on a sorting conveyor having a multiplicity of movable carriers each for receiving a respective garment hanger and garment suspended thereon;

(d) rearranging the identification signals such that each of the identification signals is positioned between other identifications signals in the preselected order;

(e) assigning a plurality of arranged identification signals to each one of a corresponding plurality of pick-off mechanisms positioned along the sorting conveyor:

(f) homing the sorting conveyor such that a preselected carrier on the sorting conveyor is at a preselected starting position;

(g) calculating bidirectional movement of the sorting conveyor from the starting position thereof to each of a plurality of potential first positions such that in each of the potential first positions a garment representative of a first identification signal in each of the plurality of arranged identification signals will be positioned for pick-off by the respective pick-off mechanism thereof;

(h) selecting one of the calculated movements which is preferred over the other calculated movements to efficiently unload the garments from the sorting conveyor;

(i) driving the sorting conveyor a fixed distance in a selected direction in response to the selected calculated movement;

(j) activating the respective pick-off mechanism to remove the garment positioned for pick-off from the sorting conveyor; and

(k) repeating steps (g) through (j) for successive conveyor positions, wherein successive calculated conveyor movements are based upon the position of the sorting conveyor

bidirectionally driven as a result of the preceding conveyor movement.

4,907,700

APPARATUS FOR TESTING THE RELEASE TORQUE OF CONTAINER CAPS

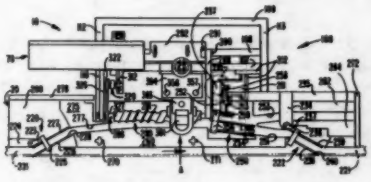
Geza E. Bankuty; LeRoy F. Byron, both of Easton, and Joseph J. Cianciullo, West Haven, all of Conn., assignors to New England Machinery, Inc., New Haven, Conn.

Continuation of Ser. No. 153,211, Feb. 8, 1988, Pat. No. 4,811,850. This application Oct. 27, 1988, Ser. No. 263,560

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] B07C *5/34*; G01L *5/00*

U.S. Cl. 209—546 **8 Claims**



1. Apparatus for testing for a predetermined minimum release torque of container caps at a torque testing station in said apparatus, said apparatus comprising:

A. Means for clamping capped containers at said station;

B. Means for grasping the caps of said containers at said station;

C. Means connected to said cap grasping means for applying a release torque to said container caps; and

D. Means including a strain gauge coupled to said release torque applying means for sensing the level of release torque applied to said caps and providing a signal indicative of said level.

4,907,701

APPARATUS FOR INSPECTING THE APPEARANCE OF SEMICONDUCTOR DEVICES

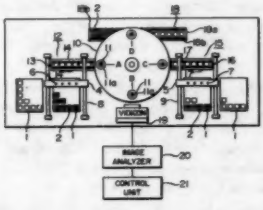
Kunio Kobayashi, and Sekio Itoh, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 19, 1988, Ser. No. 233,742

Claims priority, application Japan, Jan. 13, 1988, 63-6124

Int. Cl.[4] B07C *5/00*

U.S. Cl. 209—576 **3 Claims**



1. An apparatus for inspecting packaged semiconductor devices comprising:

a turntable including at least four vacuum chucks for holding and releasing semiconductor devices, said turntable rotating about a central axis;

means for incrementally rotating said turntable about said axis to position said vacuum chucks in first, second, third, and fourth rotational positions;

loading means for transferring uninspected semiconductor devices from storage trays to a first conveyor means for conveying the uninspected semiconductor devices to said vacuum chucks in the first rotational position; said first conveyor means including a first elongated tray having a plurality of compartments, each compartment for containing a semiconductor device and means for incrementally moving said first elongated tray towards said vacuum chucks in the first rotational position;

means for translating said vacuum chucks in the first, third, and fourth rotational positions between (i) a lowered position for engaging and releasing a semiconductor device before and after inspection, respectively, and (ii) a raised inspecting position for inspection of a semiconductor device when said vacuum chucks are in the second rotational position;

inspection means for inspecting the exterior of a semiconductor device including imaging means for forming an image of a semiconductor device held by said vacuum chucks in the second rotational position and image analyzing means for analyzing the image formed by said imaging means and for determining whether an imaged semiconductor device is acceptable;

second conveyor means for conveying acceptable semiconductor devices away from said vacuum chucks when in the third rotational position, said second conveyor means including a second elongated tray having a plurality of compartments, each compartment for holding a semiconductor device, and means for incrementally moving said second elongated tray away from said turntable when said vacuum chucks are in the third rotational position;

unloading means for transferring acceptable inspected semiconductor devices from said second elongated tray to storage trays;

discard means for receiving unacceptable semiconductor devices when said vacuum chucks are in the fourth rotational position; and

control means responsive to said inspection means for controlling said means for incrementally rotating said turntable and said means for translating to release an acceptable semiconductor device from a vacuum chuck in the third rotational position and to release an unacceptable semiconductor device from a vacuum chuck in the fourth rotational position to said discard means.

4,907,702

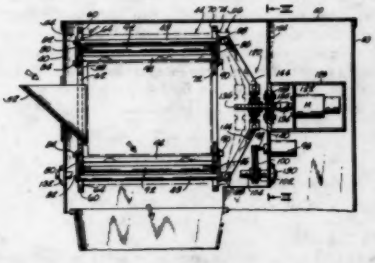
AUTOMATIC CHIP CLASSIFIER AND SYSTEM

Joseph B. Bielagus, Tualatin, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 22, 1988, Ser. No. 146,990

Int. Cl.[4] B07B *13/05*

U.S. Cl. 209—664 **9 Claims**



1. A chip classifier comprising;

a drum for receiving a volume of chips on the inside thereof;

said drum including a plurality of rods defining adjustable spaces at the perimeter of said drum, each of said rods having a longitudinal axis, said spaces enabling chips of

predetermined thickness to pass from the inside of said drum through said spaces to the outside of said drum;

drive means for rotating said drum; and

an adjustment mechanism controlling the radial position of at least some of said rods defining adjustable spaces at the perimeter of said drum for varying the thickness of chips passing from the inside of said drum to the outside of said drum by varying the size of spaces defined, said adjustment mechanism including means for moving the longitudinal axis of at least some of said rods along a substantially radial path.

4,907,703

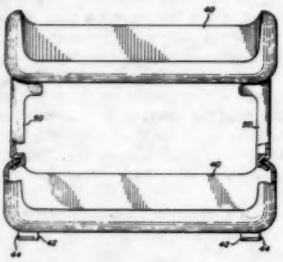
OFFICE DESK STORAGE SYSTEM

Andrew L. Alger, Wilmette; Marlan H. Polhemus, Chicago; Albert B. Cheris, Glencoe, and Richard L. Gibson, Glen Ellyn, all of Ill., assignors to Tenex Corporation, Elk Grove, Ill.

Division of Ser. No. 896,867, Aug. 15, 1986, abandoned. This application Jun. 2, 1988, Ser. No. 201,543

Int. Cl.[4] B42F *17/00*

U.S. Cl. 211—10 **1 Claim**



1. An adjustable paper tray system for selectively adjusting the relative vertical and horizontal spacing between trays, comprising:

a plurality of couplable and stackable trays with a bottom surface and top edges;

adjustment brackets secured to the bottom of said trays, wherein each of said adjustment brackets includes a protruding element that, together with the bottom surface of said trays, forms a channel for slidably engaging said top edges of a first one of said trays in close vertical proximity with the bottom surface of a second tray above said first tray; and

stacking brackets for spacing said trays substantially more vertically distant than with said adjustment brackets, said stacking brackets comprising a bottom clip portion slidably adapted to couple with the top edge of said trays, an elongated post portion, and a top portion adapted to engage said adjustment bracket, said top portion including flexible snap clips securable around said adjustment brackets by retention elements that slide into channels between said top portion and said flexible snap clips.

4,907,704

JEWELRY HOLDER

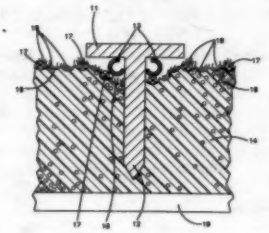
Karen Souders, 449 Colgate Ave., Elyria, Ohio 44035

Filed Oct. 11, 1988, Ser. No. 255,489

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—13 **11 Claims**

1. A holder for an object such as jewelry or the like which has a pin-like penetrating part and a shorter protrusion on one side, the holder comprising a pad having a self-healing working surface that exposes a multitude of open cells and has an at least partial facing of discontinuous paint on said working surface, said open cells and discontinuous paint being for the purpose of assisting to obliterate puncture marks from service, the pad having sufficient depth for gripping and retaining the pentetrating part of the object to be held, the pad consisting essentially of resilient foamed polymer, the working surface



being readily penetrable by the penetrating part and depressible by the shorter protrusion for the purpose of accepting said penetrating part that is to be gripped and retained by the foamed polymer.

4,907,705

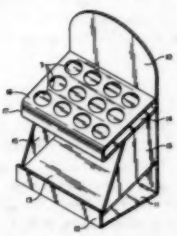
DISPLAY CASE

William D. Waldeck, 210 Main St., Belpre, Ohio 45714-0508

Filed May 22, 1989, Ser. No. 355,258

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—13 **7 Claims**



1. A display case comprising

a vertically extending back portion,

a base portion having four sides, one side connected to said back portion at the lower extremity of said back portion, and said base portion extending horizontally from said lower extremity of said back portion,

a downwardly sloping lower flat display tray portion attached to said back portion adjacent to but spaced from the lower extremity of said back portion and joined to said base portion adjacent to the side of said base portion which side is opposite to the side of said base portion which is connected to said back portion,

a first downwardly sloping upper flat display tray portion attached to said back portion adjacent to but spaced from the upper extremity of said back portion,

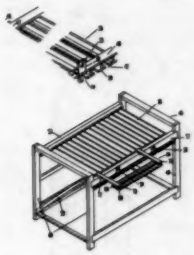
a second downwardly sloping upper flat display tray portion attached to said back portion adjacent to but spaced from the upper extremity of said back portion and positioned above and spaced from said first downwardly sloping upper flat display tray portion, said second downwardly sloping upper flat display tray portion being provided with a plurality of openings therein.

4,907,706

STORAGE AND HANDLING SYSTEM

Joseph Henderson, 2211 E. Curry St., Long Beach, Calif. 90805

Filed Sep. 22, 1988, Ser. No. 247,671
Int. Cl.[4] A47F 7/16
U.S. Cl. 211—46 8 Claims



1. A storage and handling system for large, flexible sheets such as printing plates which comprises:

a. a rack having upright standards and at least one horizontal shelf support formed by first and second longitudinal rails, formed of U-shaped channel members having a vertical web and coextensive upper and lower horizontal webs, which are attached at their opposite ends to said upright standards;

b. a shelf comprising a pair of spaced apart and parallel first and second shelf rails, and spanning therebetween a plurality of horizontal support members disposed parallel to each other and at regular and spaced intervals and thereby defining along each of said spaced intervals, a plurality of horizontal tracks with open channels along their bottom surfaces and distally supported from and permanently secured to said first and second shelf rails, and including a first set of attachment brackets carried on said first shelf rail to secure it to the first of said shelf support rails of said rack and a second set of attachment brackets carried on said second shelf support rail, each of said second set attachment brackets having a base leg and an upwardly and inwardly inclined leg at one end thereof and a vertical leg at the opposite end thereof and disposed to receive said lower horizontal web of said second shelf rail between said inclined and base legs, whereby to secure it to the second of said shelf support rails of said rack;

c. a like plurality of tee bars having a vertical web and symmetric horizontal side flanges, each mounted with its vertical web slidably and removably received within a respective open channel of a horizontal track and with its side flanges resting on the bottom surface of its respective track;

d. a plurality of apertures at spaced apart locations through the vertical web of each of said tee bars;

e. a plurality of double ended hooks with their upper hook ends received in selected ones of said plurality of apertures;

f. a plurality of flexible sheets having a second plurality of apertures at selected positions adjacent one side edge thereof; and

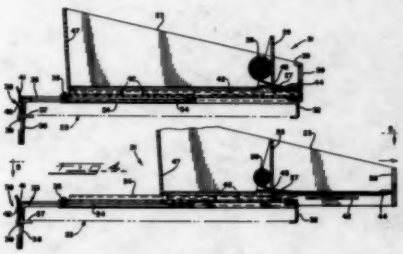
g. the lower hook ends of said hooks received in selected ones of said second plurality of apertures, whereby each of said flexible sheets is supported at opposite corners along its said side edge by a respective tee bar, and each tee bar is removably and slidably mounted in a respective horizontal track of said shelf.

4,907,707

MERCHANDISER ASSEMBLY

Peter Crum, Belgium, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 4, 1988, Ser. No. 176,954
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—59.3 10 Claims



1. A merchandiser assembly for use in storing and displaying products in a shelf-like orientation, the merchandiser assembly comprising:

product tray means for holding and supporting a plurality of merchandised products, said product tray means having a front end portion and a rear end portion;

track means for providing generally horizontally oriented support of said product tray means, said track means having a front portion;

engagement means of said product tray means and of said track means for effecting sliding engagement between said product tray means and said track means and for permitting said product tray means to move with respect to said track means along a pathway that is generally longitudinally oriented with respect to said product tray means;

a generally upstanding product follower member slidably mounted with respect to said product tray means for movement generally between said rear end portion and said front end portion of the product tray means;

biasing means for urging said product follower member and any merchandised products in front of said product follower member generally toward said front end portion of the product tray means;

stop means for engaging said product follower member with said front portion of the track means when the merchandiser assembly is in a fill mode at which the front end portion of said product tray means is slidably extended beyond said front portion of the track means, whereby movement of said generally upstanding product follower member beyond said front portion of the track means is prevented and whereby said product follower member is positioned in spaced away relationship with respect to said front end portion of the product tray means in opposition to said biasing means;

clamp means are included along said track means, said clamp means being for securing the merchandiser assembly to a shelf, said clamp means including an adjustable securement assembly having generally U-shaped means for adjustably engaging a rear edge of the shelf and for adjustably engaging a bottom edge of the shelf;

said adjustable securement assembly includes ratcheting tie means for one-way adjustment of a shelf-engaging member of the generally U-shaped means; and

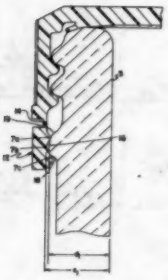
said ratcheting tie means includes an elongated tie and a ratchet block secured to one component of said generally U-shaped means, said elongated tie having a tail in ratcheting engagement with said ratchet block and a head in engagement with another component of said U-shaped means.

4,907,708

DOUBLE BEAD TRACK CAP SYSTEM

Edward F. Csaszar, Mountainside, N.J., assignor to General Kap Corporation, Bound Brook, N.J.

Filed Jan. 11, 1989, Ser. No. 295,971
Int. Cl.[4] B65D 41/34
U.S. Cl. 215—252 14 Claims



1. A tamper-evident closure for application to a container body,

said container body including an open end and having a radially projecting annular collar disposed proximate said open end, said annular collar having a predetermined longitudinal length at a predetermined axial position thereon,

said closure comprising a one-piece closure body including a horizontal end wall and a cylindrical side wall,

said cylindrical side wall including an upper portion, an annular lower skirt portion and an intermediate side wall portion therebetween.

said intermediate side wall portion including frangible means, said frangible means defining an area of weakness for providing evidence of closure dislocation by fracture thereof,

said annular lower skirt portion including an inner surface, said inner surface defining a radially protruding upper raised portion, a radially protruding lower raised portion and a radial indented central depressed portion therebetween, said central depressed portion having a diameter which is greater than the diameter of said upper and lower raised portions and which is greater than the diameter of said annular collar portion of said container thereby providing a space therebetween, and said central depressed portion having a longitudinal length substantially corresponding to said predetermined longitudinal length of said annular collar at said predetermined axial position,

whereby, said radially projecting annular collar can be locked between said upper raised portion and said lower raised portion within said central depressed portion creating a locked condition, said locked condition causing fracture of said frangible portion upon removal of said closure from said container body.

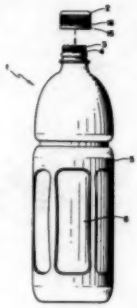
4,907,709

COMBINATION OF SYNTHETIC RESIN BOTTLE AND CLOSURE THEREFOR

Morio Abe, and Ichiro Yokota, both of Ageo, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,599
Claims priority, application Japan, Nov. 11, 1987, 62-283088
Int. Cl.[4] B65D 53/00
U.S. Cl. 215—252 5 Claims

1. A combination of a bottle and a closure for containing a drink, having an improved sealability, said bottle being produced by a blow-molding process with a resin comprised mainly of a polyethylene terephthalate, so that a bottle neck is in a non-crystalline state while a bottle body is given an improved heat durability by a bi-axial orientation followed by a heat treatment for relaxation, said closure being formed by a resin and provided with a top wall and a side wall having a thread on the inner surface thereof corresponding to a thread on the outer surface of the bottle neck, said closure comprising



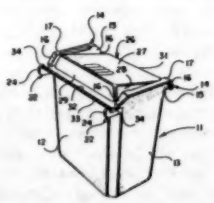
an annular shoulder on the top wall thereof which is engageable with the annular upper surface of said bottle neck and with the outer surface of the bottle neck adjacent thereto and an annular rib protruded downward from the top wall at a place inside the shoulder to be resiliently engageable with the inner surface of the side wall of the bottle neck.

4,907,710

TRASH CAN WITH INTEGRAL DUSTPAN FOR UTILIZATION OF PLASTIC LINERS WITH HANDLES

Catherine S. Bulkens, 937 Tom Smith Rd., Lilburn, Ga. 30247

Filed Feb. 16, 1988, Ser. No. 156,403
Int. Cl.[4] B65D 90/00; A63B 55/04
U.S. Cl. 220—1 T 2 Claims



1. A trash container adapted to support a flexible, non self-supporting, thin walled, plastic bag within the container, wherein the bag has an open end flanked by a pair of flexible handles, each of which have a receiving aperture therein, the handles further being designed to attach to the container and maintain the plastic bag in an open condition and to substantially fill the container, the improvement comprising:

the container having a bottom panel and a pair of opposed upstanding side walls and a pair of opposed end walls, the side walls and end walls each having a proximal end and a distal end, the side walls and end walls being connected to one another to form a peripheral container wall and being connected to the bottom panel at the proximal end of each of said side walls and end walls,

said distal ends of the side walls and end walls defining an upper opening for the container, a peripheral edge being defined by the termination of said peripheral wall at the distal ends of said side walls and end walls,

first and second bag handle engaging means integral with the

peripheral edge of respective opposed end walls, each handle engaging means projecting upwardly from the container opening in a plane parallel to the end wall adjacent to the respective handle engaging means and having a handle support flange attached to the peripheral edge of said respective opposing end wall,

lifting means attached to respective support flanges and projecting outwardly from and perpendicularly to the plane of each respective end wall,

each lifting means comprising a protruding lip having opposed ends and lying substantially parallel to the peripheral edge of the upper opening of the container,

the lifting means terminating at said opposed ends in a downward incline to a point at a predetermined distance from the peripheral edge of the perspective end wall,

wherein said predetermined distance defines a bag handle contact area adapted to receive a respective plastic bag handle therearound,

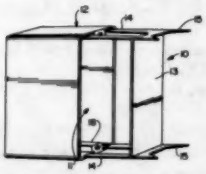
a removable top cover which can be pivoted between a first position covering said upper opening of said container and a second position uncovering said upper opening of said container, said cover fitted to said container wherein said top cover defines a dustpan having a bottom with a free edge, two opposed side walls attached to the pan bottom, an end wall attached to each pan side wall and to the pan bottom, both of said side walls and the end wall having a free edge, said free edge of the end wall, the free edge of each of the side walls and the bottom free edge defining a peripheral edge, and a flange attached to said peripheral edge projecting outwardly from the dustpan, and support pivot means, adapted to support the removable top cover, projecting from said opposed end walls of the trash container, said support pivot means comprising a pair of elongated tabs, each tab having a pivot surface and an upwardly extending tab portion, said pivot surface and tab portion permitting said top cover to be removable for use and retaining said cover when pivoted between said first and second positions.

4,907,711

OUTLET BOX COVERS WITH LOCATION INDICATORS FOR WALL COVERING

Charles F. Stuchlik, III, R.D. 1 - Box 304 B, Milton, Del. 19968

Filed Nov. 4, 1988, Ser. No. 267,270
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.8 **20 Claims**



1. A protective cover for covering an opening, comprising:

a cover plate having dimensions corresponding to the dimensions of the opening;

at least two projections extending from said cover plate in a first direction away from said opening for preventing said cover plate from being covered;

at least one handling member extending from said cover plate between said at least two projections;

at least one leg portion extending from said cover plate in a direction opposite to said at least one projection;

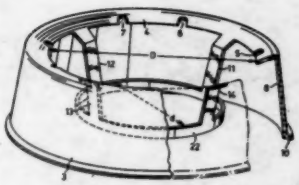
said leg portion slidably engaging with inside surfaces of the opening such that the cover plate is securely held in position covering the opening.

4,907,712

TANK STABILIZER

David R. Stempin, 847 Warwick Drive, Burlington, Ontario, Canada L7T 3Y4

Continuation-in-part of Ser. No. 246,079, Sep. 19, 1988. This application Jun. 28, 1989, Ser. No. 375,457
Int. Cl.[4] B65D *7/00*
U.S. Cl. 220—69 **8 Claims**



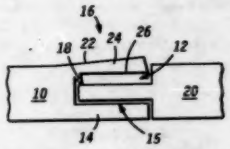
1. A stabilizer for a pressurized gas cylinder having a ring-shaped foot mounted on its lower curved end, said stabilizer comprising a hollow truncated cone-shaped member having the upper edge of its wall terminated in an inwardly projecting lip and the lower edge of its wall having a diameter greater than said cylinder, the said upper edge having a diameter slightly greater than said cylinder and the diameter of the edge of said lip having a diameter slightly less than the diameter of said cylinder including at least two flexible straps having first and second ends, connected to opposite edges of said lip by their said first ends and joined together at their said second ends, the length of said straps being such that, when the cylinder is inserted in said stabilizer, said straps engage the inserted end of said cylinder and suspend the said cylinder in said stabilizer.

4,907,713

ELECTRONIC HOUSING MODULE

John S. Walker, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 27, 1989, Ser. No. 329,166
Int. Cl.[4] B65D *6/34*
U.S. Cl. 220—76 **12 Claims**



1. A housing module comprising:

a plurality of housing wall means, said housing wall means comprised of malleable material;

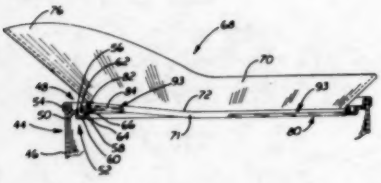
a plurality of coupling means for securing said plurality of housing wall means together, each of said plurality of coupling means including at least one groove means;

said coupling means crimped onto at least one each of said plurality of housing wall means when said plurality of housing wall means is inserted into said at least one groove means;

said plurality of housing wall means extruding into said at least one groove means when said plurality of coupling means is crimped onto said plurality of housing wall means; and

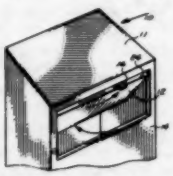
said plurality of coupling means and said plurality of housing wall means forming a predetermined enclosure.

4,907,714
RESILIENT PAINT CAN ACCESSORY
Michael F. Gatz, 517 94th Ave. North, Naples, Fla. 33963
Continuation-in-part of Ser. No. 52,268, May 21, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,230
Int. Cl.[4] B65D *25/48*
U.S. Cl. 220—90 **19 Claims**



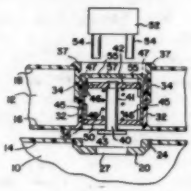
1. A resilient paint can accessory configured to be removably mounted on paint cans of varying top dimensions including a trough having a sealing/seating ring including an inner circumference extending inwardly therefrom toward the center of the paint can, said resilient paint can accessory comprising a hollow frustrum stir skirt having a deformable ring extending downwardly from the lower periphery thereof cooperatively forming a seat therebetween to selectively receive the inner circumference of the sealing/seating ring therein, a front attachment portion including a primary front substantially round attachment element and a pair of secondary front substantially round attachment elements formed in spaced relationship thereto and a rear attachment portion including a rear substantially round attachment element formed on said deformable ring immediately adjacent said seat, said primary front substantially round attachment element being at least one and one half twice the length of each of said secondary front substantially round elements and said rear substantially round attachment element being at least three times length of said primary front substantially round attachment element such that said front and rear attachment portions engage the lower portion of the sealing/seating ring whereby a seal is formed between the inner circumference of the sealing/seating ring and said seat when said resilient paint can accessory is mounted on the paint can, said resilient paint can accessory further includes a stir area formed by said hollow frustrum stir skirt and a pour spout extending outwardly from the forward portion of the upper periphery of said hollow frustrum stir skirt to form a pour area to contain paint within said stir area when stirring the paint within the paint can and to direct the paint from the paint through said pour area when pouring paint from the paint can.

4,907,715
DOOR OPENER
John J. Bloomer, 10311 Camino de la Placita, Tucson, Ariz. 85748
Filed Nov. 7, 1988, Ser. No. 267,835
Int. Cl.[4] B65D *43/26*
U.S. Cl. 220—263 **5 Claims**



1. A trash receptacle comprising, in combination a receptacle housing having a top and side walls with a door mounted in a side wall of said housing in a manner such that said door can swing into the interior of said housing to an open position, an opening in said side wall and above said door, a door opening assembly mounted within said housing and above said door, said assembly including a mounting plate, a link bar pivotally mounted to said plate and on the top side thereof and extending to the exterior of said housing through said opening, means mounted on the under side of said plate and connecting said link bar to said door whereby lateral movement of said link bar will cause said door to swing into the interior of said housing to an open position.

4,907,716
LOCK MECHANISM
Dean R. Wankel, and Patricia S. Wankel, both of Rolling Acres #155, Jacksonville, Ill. 62650
Filed Jul. 13, 1989, Ser. No. 379,101
Int. Cl.[4] B65D *55/14*
U.S. Cl. 220—326 **4 Claims**



1. In association with a cooler cabinet that includes a wall having one exposed face and one concealed face; and a lid that includes two spaced walls, each of which has one exposed face and one concealed face, the improvement comprising:

a lock bolt mechanism secured to the lid, and a keeper mechanism secured to the cabinet;

said keeper mechanism comprising a plate affixed to said cabinet wall so that it does not project beyond the exposed face of the wall;

said plate having a slot therethrough;

said lock bolt mechanism comprising a tubular housing that includes two telescopically connected tubes extending into the space between the lid walls; said tubes having external flanges thereon exerting clamp forces on the exposed faces of the lid walls so that the tubular housing extends entirely through the lid; a lock bolt arranged for axial and rotary motion within the tubular housing; guide means within the housing constraining the bolt against rotary motion except when said bolt is in a predetermined position of axial adjustment;

a hook carried on the bolt in registry with the slot in the keeper plate;

spring means biasing the lock bolt away from the keeper plate; and a manually-operated key engageable with the bolt to move same axially a predetermined distance to the aforementioned predetermined position, after which the key can be rotated to turn the bolt and associated hook;

said hook being oriented on said bolt so that when the key is turned the hook will lockably engage a concealed face of the keeper plate.

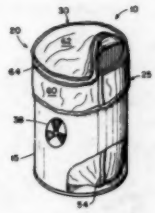
4,907,717
LOW-LEVEL RADIATION WASTE MANAGEMENT SYSTEM
Kenneth W. Kubofcik, 6 Quail Ct., Shelton, Conn. 06484
Filed Feb. 18, 1988, Ser. No. 157,384
Int. Cl.[4] B65D *90/04*
U.S. Cl. 220—404 **21 Claims**

1. A low-level radiation waste container set for use in con-

junction with an open-topped receptacle, the container set comprising:

A. a receptacle liner having a closed end and an open end, the receptacle liner sized for deployment as an inserted liner in an open-topped receptacle for collecting low-level radiation waste material within the receptacle liner within the open-topped receptacle;

B. a cover sized and shaped to fit over the open top of the open-topped receptacle and the receptacle liner therein



with the cover is in a closed position, the cover having a depending skirt which, when the cover is in the closed position, extends downwardly to overlap the open-topped receptacle adjacent the open top thereof and a portion of the receptacle liner received therein; and

C. the receptacle liner and cover being fabricated of flexible radiation shielding material, whereby the cover may be partially opened to insert low-level radiation waste material and the cover may be inserted into the receptacle liner for disposal.

4,907,718

METHOD OF AND APPARATUS FOR FEEDING TACKS TO SHOE LASTING MACHINES

Wolfgang Emmerich, Bad Münstereifel, Fed. Rep. of Germany, assignor to Hacoba-Textilmaschinen GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

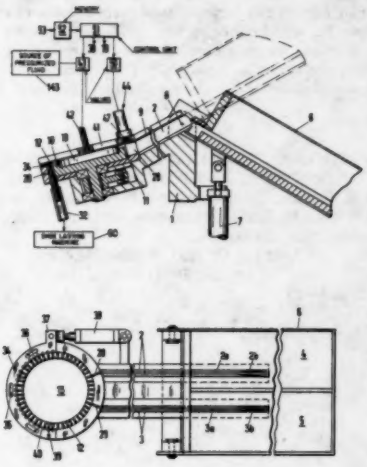
Filed Dec. 2, 1988, Ser. No. 279,560

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740941

Int. Cl.[4] B65G *29/02*

U.S. Cl. 221—1 **29 Claims**

1. Apparatus for feeding to a lasting machine tacks of the type having a head and a shank extending from the head, comprising a rotor having a peripheral surface and substantially axially parallel flutes provided in said peripheral surface for reception of shanks of discrete tacks; means for supplying tacks to said rotor, including at least one track having a discharge end adjacent said peripheral surface and arranged to admit into said flutes the shanks of a series of successive tacks in corresponding angular positions of said rotor relative to said discharge end; a housing having an internal surface adjacent said peripheral surface and provided with pockets each of which registers with one of said flutes in each of a plurality of different angular positions of said rotor relative to said housing; means for simultaneously transferring tacks from said rotor into said pockets; means for conveying tacks from said pockets to a lasting machine; stop means actuatable to engage a tack in the region of said discharge end so as to prevent the



engaged tack and the following tacks of said series from leaving said track; and means for actuating said stop means.

4,907,719

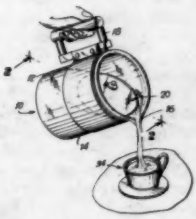
CONTAINER FOR COLLECTING, PRESERVING, AND SERVING HOT BEVERAGES

Clifford H. Spotholz, Montvale, N.J., and Edward L. Scarsella, Bedford Hills, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 441,341, Nov. 15, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,915

Int. Cl.[4] A47J *31/00*

U.S. Cl. 222—1 **5 Claims**



1. In a method for collecting and preserving coffee using an electric, drip-type coffee maker wherein heated water is passed through an extraction basket which contains roasted coffee and the liquid coffee which passes from the extraction basket is collected in a vessel which rests on a flat heating platen the improvement comprising:

(a) said vessel having a cylindrical shape, a pour spout located on its top rim and a vertically-oriented handled member located diametrically opposite said spout;

(b) placing a bouyant lid in the vessel before any liquid coffee is collected in the vessel such that the lid floats on and covers on the rising surface of liquid coffee which is collected in the vessel, said lid having a diameter which is from 95% to less than 100% of the internal diameter of the

vessel, said lid being made of glass, a hydrophobic, food-approved polymeric material or a combination thereof, said lid having an intergrally disposed knob or lifting means for extracting the lid from the vessel and said lid being effective to prevent oxidation of and loss of volatiles from the liquid coffee;

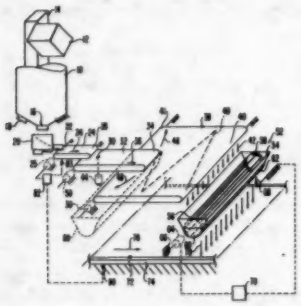
(c) providing spacer means between the heating platen and the vessel such that a portion of the heat emitted from the platen is dissipated to the surrounding air.

4,907,720

METHOD AND APPARATUS FOR UNIFORMLY DISPENSING A SEASONING MATERIAL

James K. Henson, Garland; Wilfred M. Bourg, Jr., Arlington, and William D. Henson, Ducanville, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed May 13, 1987, Ser. No. 49,098
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—55 **12 Claims**



1. An apparatus for uniformly dispensing particles of seasoning material onto a food product, comprising:

(a) a moving product conveyor for carrying a food product to be seasoned;

(b) a seasoning applicator including an elongate trough disposed above the moving product conveyor for dispensing seasoning material onto food product carried on the moving product conveyor, the trough having a screened bottom, the seasoning applicator including rotating means within the trough for fluffing seasoning within the trough and for promoting uniform dispensing of seasoning through said screened bottom onto food product carried on the product conveyor;

(c) means for controlling the rotational speed of the rotating means within the trough to maintain a desired weight of seasoning material within the trough;

(d) a transfer conveyor having a receiving area across a top surface thereof for receiving seasoning material and a first delivery end downstream of the receiving area, the transfer conveyor being comprised of a first moving conveyor belt for conveying seasoning from the receiving area of the transfer conveyor over the first delivery end of the transfer conveyor, the first delivery end of the transfer conveyor being disposed over the elongate trough of the seasoning applicator for depositing seasoning into the elongate trough;

(e) a spreading conveyor having a seasoning drop point for receiving seasoning on a top surface thereof and a delivery end downstream of the seasoning drop point, the spreading conveyor being comprised of a second moving conveyor belt for conveying seasoning from the seasoning drop point over the delivery end of the spreading conveyor, the delivery end of the spreading conveyor being disposed above the transfer conveyor for spreading seasoning across the receiving area of the transfer conveyor;

(f) means for moving the delivery end of the spreading conveyor above the receiving area of the transfer conveyor to spread seasoning material across said receiving area in a zig-zag pattern; and

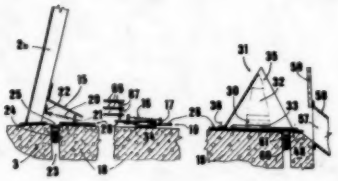
(g) means for continuously depositing seasoning material onto said seasoning drop point of said spreading conveyor at a controlled rate.

4,907,721

APPARATUS FOR REMOVING RESIDUAL STORED MATERIAL

Jean-Claude Poncet, Champagne-sur-Loue, 39600 Arbois, France

Filed Sep. 10, 1987, Ser. No. 94,896
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—58 **31 Claims**



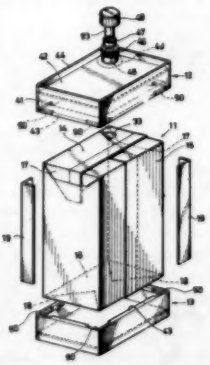
1. A bulk storage facility for storing a pile of particulate material, said facility comprising a foundation including a central, substantially horizontal channel, a recovery conveyer disposed in said channel, a base slanted to a degree to cause residual particulate material to have a residual slope and having a lower edge opening into said channel, a plurality of plates positioned adjacent each other so as to form a substantially continuous deck substantially parallel to and supported by said base, a plurality of vibrators mounted on said deck in a predetermined pattern and including means for vibrating said deck with a predetermined amplitude and frequency so as to disrupt the foot of said residual slope to assist conveyance of said particulate material into said conveyer.

4,907,722

EASILY OPENABLE SEALED CONTAINER

Kazuo Ueda, and Takehiko Aihara, both of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Mar. 2, 1988, Ser. No. 162,933
Claims priority, application Japan, Mar. 4, 1987, 62-32413[U]
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—83 **4 Claims**



1. An easily openable sealed container comprising:

a rectangular parallelepipedal main body made of a paper-base laminate and having a top wall and a trunk wall, the top wall being formed with an opening forming thin wall portion,

a caplike reinforcing cover fitted over the top end of the main body and having a top wall and a peripheral wall, the cover top wall being provided with an aperture opposed to the thin wall portion and an externally threaded spout projecting upward from the aperture-defining edge portion of the wall,

a cap nut screwed on the spout and having a peripheral wall and a top wall, and

a cutter integral with the cap nut for cutting the thin wall portion.

4,907,723

FLUID DISPENSER INCLUDING AN ARRANGEMENT TO IMPART WAVE-LIKE MOTION TO THE STORE FLUID

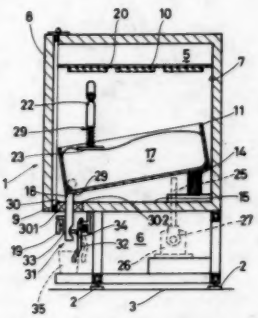
Solly Katz, 173 Rechov, Hakeramim, Hakeramin, Efrat, Israel (90962)

Continuation-in-part of Ser. No. 24,083, Mar. 10, 1987, Pat. No. 4,784,297. This application Sep. 8, 1988, Ser. No. 242,169

Claims priority, application South Africa, Mar. 10, 1986, 86/1737

Int. Cl.[4] B67D *5/06*

U.S. Cl. 222—105 **18 Claims**



1. A fluid dispenser comprising a cradle for a fluid container in the form of a flexible bag, said cradle being positioned for holding the container inclined downwardly to a dispensing end thereof, means for intermittently causing wave-like motions to the contents of the container; and

the means for causing the wave-like motions comprises means for applying pressure to a wall of the flexible bag adjacent its dispensing end.

4,907,724

DISPOSABLE PRE-MIX BEVERAGE PACKAGE FOR USE IN OUTER SPACE

George R. Wing, Jr., Acworth, and Arthur G. Rudick, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 9, 1985, Ser. No. 764,251

Int. Cl.[4] B65D *35/56*

U.S. Cl. 222—105 **6 Claims**

1. A package for storing and dispensing a carbonated beverage pre-mix directly into a consumer's mouth in the microgravity conditions of outer space comprising:

(a) a rigid container having a removable lid portion for opening the container;

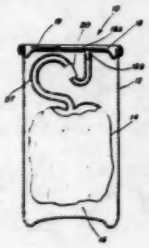
(b) a collapsible bag disposed within the rigid container, said bag containing the carbonated beverage pre-mix;

(c) a drinking tube coupled to said bag for dispensing said carbonated beverage directly into the consumer's mouth, said drinking tube being flexible and foldable within said rigid container in a storage position and extending outside said rigid container to the consumer's mouth in a drinking position;

(d) a valve associated with said tube for starting or stopping the flow of carbonated beverage therethrough;

(e) manual actuator means for opening or closing said valve to start or stop said flow, respectively;

(f) gas disposed in said rigid container around said collapsible bag, said gas having a sufficient initial counter pressure to ensure that the carbonation of said carbonated beverage pre-mix remains in solution when the rigid container is closed by said removable lid portion; and



(g) means for coupling said removable lid portion and drinking tube together so that when said lid portion is removed from said container the drinking tube is pulled from the storage position to the drinking position, whereby said means for coupling is selectively removable by the consumer at the time of consumption.

4,907,725

LIQUID DISPENSER MIXING NOZZLE

Samuel Durham, San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.

Filed Jan. 12, 1987, Ser. No. 2,612

Int. Cl.[4] B67D *5/56;* **B01F** *5/06*

U.S. Cl. 222—129.1 **3 Claims**

1. A beverage mixing nozzle comprising:

a housing defining a mixing chamber having an inlet and an outlet;

a plurality of interdigitated baffles removably received within said mixing chamber, said baffles being substantially horizontal and having a plurality of upwardly protruding ridges;

a cylindrical support member removably received within said mixing chamber, said cylindrical support member formed of at least two adjacent longitudinal members;

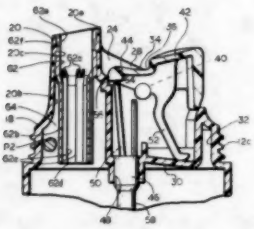
said baffles being supported by a sidewall of said cylindrical support member.

4,907,726

STRIPPING DISPENSER PACKAGE FOR VISCOUS PRODUCTS

Kurt N. Harris, Haskins, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Oct. 27, 1988, Ser. No. 263,467
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—145 **19 Claims**



1. A dispensing package for containing and dispensing a composite product comprising a first viscous product and a second viscous product, said composite product having a bead of the first viscous product with the second viscous product being applied to the exterior of the bead in at least one longitudinally extending strip, said dispensing package comprising:

a container having a body portion with an inside, a first end and a second end, said first end serving as a dispensing end, said container further having wall means extending across said dispensing end of said container, said wall means forming an elongate, annular dispensing spout, said elongate dispensing spout having an outer, terminal portion and an inner portion;

an annular insert with an inside surface and an outside surface positioned in said elongate dispensing spout, said annular insert defining an elongate interior passage and having an outer portion positioned snugly within said outer portion of said elongate spout and an inner portion, said inner portion forming a recess with said inner portion of said annular dispensing spout, said recess being adapted to receive the second viscous product, said container further having a portion below said recess which is adapted to receive the first viscous product, said annular insert further having transverse passage means extending through said inner portion of said annular insert to permit the second viscous product from said recess to flow into said elongate passage, said inner portion of said annular insert having a free end which is adapted to be in fluid communication with the first viscous product, said outside surface of said annular insert having indentation means therein defining longitudinally extending recess means therein, said recess means being axially aligned with said transverse passage means and extending from said transverse passage means substantially to said free end; and

means for pressurizing the first viscous product and the second viscous product to cause the first viscous product to flow from said portion through said elongate interior passage of said annular insert by way of said free end of said inner portion of said annular insert and to cause the second viscous product to flow from said annular insert through at least a portion of said elongate interior passage of said annular insert by way of said longitudinally extending recess means and said passage means;

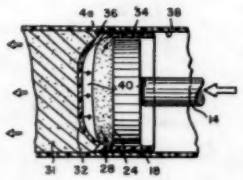
wherein said indentation means of said annular insert further defines inwardly projecting and longitudinally extending rib means, said rib means being radially aligned with said longitudinally extending recess means and having a termination at a juncture of said inner portion of said annular insert and said outer portion of said annular insert and being adapted to form at least one recess in the bead of the first viscous product, and wherein said transverse passage means is positioned near and is longitudinally aligned with said termination of said rib means and is adapted to apply the second viscous product in the recess of the bead of the first viscous product.

4,907,727

DISPENSING DEVICE HAVING IMPROVED PLUNGER ASSEMBLIES

Richard J. Ernst, and Sigismund Paul, both of Palatine, Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 264,802
Int. Cl.[4] B67D *47/02, 49/00;* G01F *11/00*
U.S. Cl. 222—386.5 **8 Claims**



1. A plunger assembly for a fluid dispenser having a frame, a cartridge containing fluids to be dispensed, and a nozzle from which said fluids to be dispensed are dispensed, said plunger assembly comprising:

an end cap disposed within said cartridge adjacent to said fluid to be dispensed, and including a generally cylindrical body portion and a dome portion projecting forwardly from said body portion, and further including an annular sealing lip disposed near the juncture of said body and dome portions of said end cap for sealingly engaging the inner wall of said cartridge; and

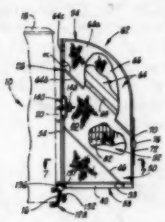
a piston assembly slideably mounted upon said dispenser frame for coaction with said end cap, and including a piston having a front face of a predetermined diametrical extent to which is integrally secured a compressible pad of elastomeric material having a diametrical extent, under non-compressed conditions, which is substantially equal to said diametrical extent of said piston face so as to permit said piston and said compressible pad to be inserted within said body portion of said end cap, said pad being positioned so as to engage said end cap proximate to said juncture of said body and dome portions of said end cap whereby an air chamber is sealingly defined between a front face of said pad and said dome portion of said end cap such that movement of said plunger assembly against said fluid to be dispensed transmits forces against said dome portion of said end cap and through said air chamber onto said front face of said elastomeric compressible pad causing said elastomeric compressible pad to be axially compressed and radially expanded beyond said predetermined diameter of said piston so as to prevent the escape of air out of said air chamber between said body portion of said end cap and said piston and to force said sealing lip into sealing engagement with said cartridge wall.

4,907,728

VEHICLE MOUNTABLE LUGGAGE CARRIER ASSEMBLY

Allen L. Giblet, 137 Quail Dr., Cordell, Okla. 73632

Filed Sep. 24, 1987, Ser. No. 100,568
Int. Cl.[4] B60R 9/06
U.S. Cl. 224—42.03 A 38 Claims



1. A luggage carrier assembly mountable externally on a vehicle comprising:

a vertically extending first rigid frame of substantially rectangular configuration and having a substantially horizontally extending upper edge and a substantially horizontally extending lower edge;

a second rigid frame of rectangular configuration secured to said first rigid frame adjacent the lower edge of said first rigid frame and extending substantially normal to said first frame in a horizontal direction; and

panel means connected between said first rigid frame and said second rigid frame and forming a luggage-containing enclosure, said enclosure having four sides and a bottom, said panel means including:

a flexible waterproof covering surrounding the interior of the luggage-containing enclosure and forming said four sides and said bottom extending between said four sides;

semi-rigid wire mesh core elements lining but not joined to the inner sides of said waterproof covering;

flexible inner fabric liners lining but not joined to the inner sides of said wire mesh core elements whereby said wire mesh core elements can be removed from between said flexible inner fabric liners and said flexible waterproof covering; and

a closure subassembly pivotally secured to said first rigid frame adjacent the horizontally extending upper edge thereof and pivotable between a closure position across the open top of said luggage-containing enclosure, and spaced vertically above the bottom thereof, and an upwardly pivoted open position which permits luggage to be placed in, and removed from, said enclosure; and

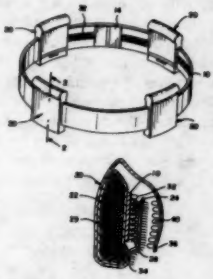
means for detachably mounting said first frame on the rear side of a vehicle at a location spaced upwardly from the bumper of the vehicle and spaced upwardly from the place where said first frame is joined to said second frame; and wherein said first frame includes a rigid sleeping and eating panel, and wherein said luggage carrier assembly is further characterized in that said means for mounting pivotally mounts said first and second frames and said panel means on the rear side of a vehicle for pivotation about a horizontal axis at said location so that said first frame and the rigid sleeping and eating panel can be pivoted into a horizontally extending position; and support means pivotally connected to said first rigid frame for supporting said assembly with respect to a surface supporting said vehicle to maintain said sleeping and eating panel in said horizontally extending position.

4,907,729

SYSTEM FOR CARRYING ARTICLES

Arnold M. Hess, III, 2033 Melody La., Juno, Fla.

Filed Jan. 26, 1988, Ser. No. 148,603
Int. Cl.[4] A45F 5/00
U.S. Cl. 224—253 2 Claims



1. A structure having means for carrying articles, comprising:

belt means provided substantially along the length thereof with direct attachment means;

a pouch having direct attachment means for securing said pouch directly to said belt;

said direct attachment means being hook and loop fastening means;

a flap extending from said pouch adapted to form a loop which encircles said belt, said flap having indirect attachment means which engages said pouch, thereby indirectly engaging said belt, said indirect attachment means comprising hook and loop fastening means;

an additional flap on said pouch containing said direct attachment means on one side thereof said indirect attachment means on the opposite side thereof, whereby said direct attachment means on said additional flap is adapted to directly engage said belt and said indirect attachment means on said additional flap is adapted to engage said indirect attachment means on said other flap and to overlay the direct attachment means in use; and

said pouch having a reclosable opening and having a sack therein adapted to hold lead shot.

4,907,730

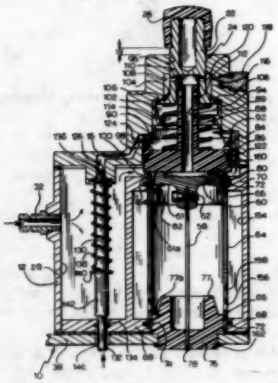
PNEUMATIC NAILER

Jean-Paul Dion, Québec, Canada, assignor to Laboratoire Primatech Inc., Quebec, Canada

Filed Mar. 29, 1989, Ser. No. 330,374
Int. Cl.[4] B25C 1/04
U.S. Cl. 227—8 8 Claims

1. A nailing tool comprising a body defining a reservoir adapted to be fed with compressed air, a cylinder fixed within said body and having a lower and an upper end, a plug closing the lower end of said cylinder and having a nailing plunger-receiving slit, a piston slidable in said cylinder, a nailing plunger fixed to said piston and extending through said slit, said piston reciprocable in said cylinder to cause said plunger to accomplish a nailing stroke, said cylinder fully open at its upper end, said body defining a chamber co-axial with and communicating with said cylinder upper end and with said reservoir, a cylinder closure having a leak-proof sliding fit with said chamber and reciprocable therein between a down-position resting on and closing said cylinder upper end, and an up-position opening said cylinder upper end; said closure having an underface which, when said closure is in down-position, protrudes outwardly from said cylinder and is exposed to the compressed air in said reservoir, a trigger located over said closure and movable between a top limit position and a down

limit position in said chamber and having a head exposed externally of said body, a compression spring located between said trigger and said closure within said chamber, a first air-feeding passage communicating said reservoir and said chamber above said closure, said trigger closing and opening said first air passage in its down and top limit positions, respectively, a first air exhaust passage communicating said chamber above said closure with the ambient air, a second air exhaust passage extending through said closure and communicating the space of said cylinder above said piston with the ambient air, said trigger closing and opening said first air exhaust passage to ambient air in its top and down limit positions, respectively, with said second exhaust air passage being closed and open to ambient air in the up-and-down positions of said closure, respectively with said trigger being in top position, the sum of the downward forces exerted by said compression spring and by said compressed air onto said closure when closed being



greater than the upward face exerted by said compressed air on said closure when closed, the downward force exerted by said compression spring on said closure when closed being smaller than the upward force exerted by said compressed air on said closure when closed, where in the rest-position of said tool, the air pressure in said chamber above said closure is equal to the air pressure in said reservoir, the air pressure in said cylinder above said piston is ambient air, said closure being kept closed not only by said compression spring but also by the force differential exerted by said air pressure over and under said closure, and a downward impact force exerted on said trigger causes downward movement of said trigger against the bias of said compression spring and exhaust of the compressed air in said chamber above said closure through said first exhaust means, whereby said closure moves to its up-position closing said second air exhaust passage and allowing compressed air from said reservoir to enter said cylinder and cause said piston to effect a nailing stroke.

4,907,731

DYNAMIC HIGH PRESSURE PROCESS FOR FABRICATING SUPERCONDUCTING AND PERMANENT MAGNETIC MATERIALS

William J. Nellis, Berkeley; Theodore H. Geballe, Woodside, and M. Brian Maple, Del Mar, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 937,794, Dec. 4, 1986, Pat. No. 4,717,627. This application Oct. 14, 1987, Ser. No. 108,348

Int. Cl.[4] H01L *39/24*

U.S. Cl. 228—2.5 **18 Claims**

1. A material fabrication system for preparation of a class of fine grain solid materials having desirable superconducting or magnetic properties, the system comprising:

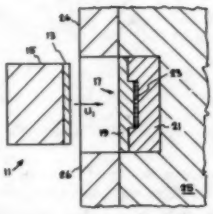
a first planar layer of a first predetermined solid material;

a second planar layer of a second predetermined solid material of thickness substantially between 1 μm and 10 mm;

a third planar layer of a third predetermined solid material positioned so that the second layer lies between the first layer and the third layer and is traversely contiguous with the first layer;

a fourth planar layer of a fourth predetermined material, of thickness substantially 10^2–10^4 μm, transversely contiguous with and positioned between said second planar layer and said third planar layer, to serve as a substrate for a film specimen in said second planar layer.

an open container for the first, second, third and fourth planar layers and having a first planar container wall, with the third layer being transversely contiguous with the first



planar container wall and being positioned so that the third layer lies between the fourth layer and the first planar container wall, and with the container having side walls that fit snugly against the side walls of the first and third layers, the container being composed of rigid material that resists deformation caused by deformation of the first layer or the third layer;

shock wave means positioned adjacent to the first layer so that the first layer lies between the shock wave means and the second layer, to produce a shock wave in the first layer so that this shock wave propagates substantially transversely through the first layer, the second layer, the fourth layer and the third layer in that order, with the velocity of propagation of the shock wave being supersonic with respect to the speed of sound in each of the materials comprising the first, second, third and fourth planar layers.

4,907,732

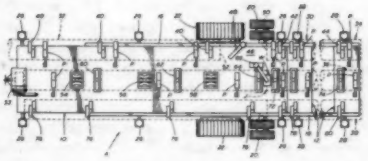
RIGHT-OF-WAY DOUBLE JOINTER

Richard L. Jones, 3776 Garnett, Houston, Tex. 77005

Filed Jan. 22, 1988, Ser. No. 147,233

Int. Cl.[4] B23K *31/06, 37/04*

U.S. Cl. 228—44.5 **27 Claims**



1. A mobile apparatus for making girth welds between two sections of pipe comprising:

an elongated main frame;

at least one subframe movably mounted to said main frame and selectively movable from a retracted position wherein said subframe is nested substantially within said main

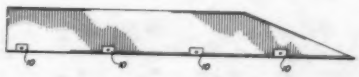
frame, and movable to an extended position wherein said subframe is substantially extended out of said main frame;
positioning means on said main and subframes for movement of both pipe sections;
welding means on said frame for attaching two pipe sections together; and
wheel means on said main frame to allow said main and sub frame to travel over roadways and to remote sites.

4,907,733

METHOD FOR ATTACHING CARBON COMPOSITES TO METALLIC STRUCTURES AND PRODUCT THEREOF

Wilson N. Pratt, Anaheim, and Robert M. Haner, Upland, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 28, 1988, Ser. No. 173,792
Int. Cl.[4] B64C *3/20, 3/26;* B23K *31/02*
U.S. Cl. 228—122 14 Claims



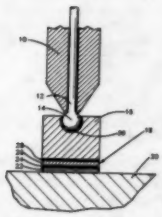
1. A method of fabricating a strong point on a carbon composite material comprising the steps of:
forming a recessed pocket region along an edge of the composite material, said region extending to both sides of the material and around said edge portion to establish pockets on both sides joined by a recessed edge portion;
forming at least one through hole in said region extending between the recessed surfaces of the two pockets on opposite sides of the composite; and
plating a layer of nickel in said recessed pocket region to fill said pockets on opposite sides of the material to a level approximately flush with the surfaces of the material adjacent the pocket regions.

4,907,734

METHOD OF BONDING GOLD OR GOLD ALLOY WIRE TO LEAD TIN SOLDER

H. Ward Conru, Essex Junction, Vt.; Stephen E. Gons, Camp Hill, Pa.; Gordon C. Osborne, Jr.; Douglas W. Phelps, Jr., both of Burlington, Vt.; Stephen G. Starr, Essex Junction, and William C. Ward, Burlington, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1988, Ser. No. 263,806
Int. Cl.[4] B23K *20/00*
U.S. Cl. 228—123 12 Claims



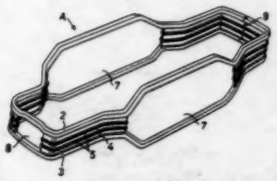
1. A method of bonding gold or gold alloy wire to lead/tin solder overlying an underlying surface, comprising the steps of:
forming said wire with an end portion having a composition of at least 50% gold, maintaining said solder at a temperature below the melting point of the lowest melting eutectic of said solder;
and compression bonding said end portion of said wire to said solder, said bonding being characterized by said end portion of said wire being forced into said solder a distance sufficient to imbed a substantial portion of said end portion in said solder, but said end portion remaining out of contact with said underlying surface;
whereby a gold/tin intermetallic compound is formed between at least part of said end portion of said wire and said solder.

4,907,735

PROCESS FOR PRODUCING A CHASSIS FOR VEHICLES

Shunta Ushioda, Yukishi; Ichizo Tsukuda, Osaka; Noboru Ohneda, and Minobu Sukimoto, both of Oyamashi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 230,175, Aug. 9, 1988, abandoned. This application Oct. 5, 1989, Ser. No. 420,634
Claims priority, application Japan, Aug. 11, 1988, 62-201423
Int. Cl.[4] B60R *21/13*
U.S. Cl. 228—173.4 4 Claims



1. A process for producing a chassis for vehicles, the process comprising: extruding a single frame element from an aluminum alloy, the frame element having a continuous cross-section and including an upper beam, a lower beam, and a web portion disposed between the two beams and connecting the two beams; removing substantially all of the web portion along a predetermined length of the beam to define a vacant portion of the web; pulling the upper beam and lower beam of the web vacant portion in opposite directions so that the web vacant portion becomes an expanded opening; bending the frame element in accordance with the size and shape of the body of a vehicle which is to be placed on the chassis; and welding the ends of the frame element into an endless frame.

4,907,736

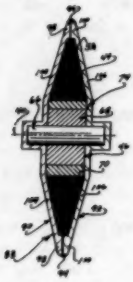
METHOD OF FORMING ARTICLES

Gordon S. Doble, Shaker Heights, Ohio, assignor to Airfoil Textron Inc., Lima, Ohio

Continuation of Ser. No. 879,366, Jun. 27, 1986, abandoned. This application May 18, 1988, Ser. No. 198,709
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—190 36 Claims

1. A method of forming an article comprising the steps of forming a preform of layers containing metal and filaments, said layers including major side surfaces and minor side surfaces extending transversely to the major side surfaces with longitudinal axes of the filaments extending generally parallel to the major side surfaces of the layers, and metallurgically bonding the layers and increasing the density of the preform, said step of metallurgically bonding the layers and increasing the density of the preform including applying a deformation force against the preform in a direction generally perpendicular to minor side surfaces of the layers and parallel to major side surfaces of the layers, plastically deforming the layers under the influence of the deformation force by decreasing the distance between the minor side surfaces of the layers and increasing the distance between the major side surfaces of the layers including preventing substantial buckling of the preform

from application of the deformation force, and maintaining the filaments substantially free of axially extending forces during



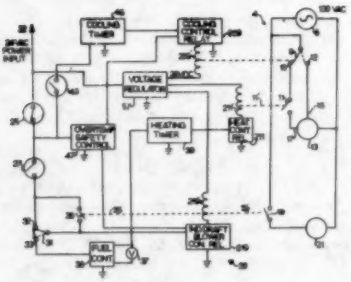
performance of the step of bonding the layers and increasing the density of the preform.

4,907,737

ELECTRONIC CONTROL SYSTEM FOR A GAS-FIRED/HOT AIR FURNACE WITH INDUCED DRAFT BLOWER

Roger W. Williams, Jr., Springfield, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Mar. 30, 1989, Ser. No. 331,603
Int. Cl.[4] F24H *3/00*
U.S. Cl. 236—11 **8 Claims**



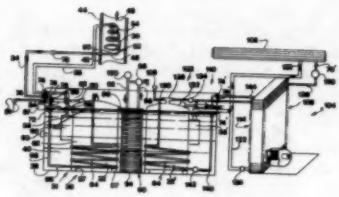
1. Solid state control for a gas-fired/hot air furnace which includes a comfort fan blower having windings adapted when energized to drive the fan at high and low speeds and an induced draft blower adapted to supply air into the combustion chamber of the furnace, said control comprising a normally open heating thermostat switch which upon closing, generates a first signal and a normally closed, over-temp control element adapted to open only when the furnace temperature exceeds a predetermined limit, means responsive to the opening of said control element to generate a second signal, means responsive to said first signal to energize both said induced draft blower and the low speed windings of said comfort fan, and means responsive to said second signal to energize the high speed windings of said comfort blower and said induced draft blower.

4,907,738

HEAT PUMP

Kenneth J. Harris, Mentor, Ohio, assignor to Conserve, Inc., Erie, Pa.

Continuation of Ser. No. 652,286, Sep. 20, 1984, abandoned. This application Aug. 2, 1985, Ser. No. 762,550
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 B **15 Claims**



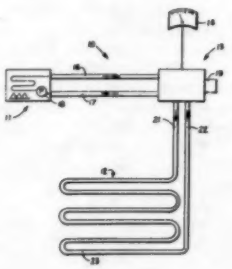
1. A heat pump installation including a first heat pump comprising a compressor, condenser and evaporator and utilizing as a source of waste heat waste heat exhaust through a duct, with the evaporator being positioned in such duct, said installation comprising a tank of liquid in which the compressor and condenser are immersed, and a second heat pump including a compressor, condenser and evaporator for room heating or air conditioning with the compressor and condenser thereof also immersed in the liquid of said tank.

4,907,739

HEATING METHOD AND APPARATUS

Lawrence V. Drake, Buffalo, Minn., assignor to Gyp-Crete Corporation, Hamel, Minn.

Continuation-in-part of Ser. No. 854,842, Apr. 22, 1986, abandoned. This application Nov. 17, 1986, Ser. No. 931,682
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—8 C **8 Claims**



1. A radiant heating system for heating a selected area comprising:

fluid heating means operable to heat a fluid,

heat transfer means for accommodating heated fluid located in a selected area operable to allow heat to radiate to the environment adjacent the selected area,

control means connected to the fluid heating means and heat transfer means for regulating the flow and temperature of the fluid to the heat transfer means,

means to move fluid from the fluid heating means to the control means and return fluid from the control means to the fluid heating means, said control means having a pump for transferring fluid to the heat transfer means, a housing of material having a coefficient of thermal conductivity of less than 1.0 kcal/m h °C., a valve body defining a plurality of chambers within the housing, a valve movable

within the valve body to control the recirculation of the return fluid from the heat transfer means back to the heat transfer means, and a temperature responsive actuator operable to control the position of the valve in response to the temperature of the fluid directed to the heat transfer means, thereby regulating the temperature of the fluid delivered to the heat transfer means, said housing having an internal passage, a pump in communication with the internal passage, and an outlet passage in communication with the pump chamber connected to heat transfer apparatus, said pump having rotatable means located in said pump chamber operable to pump fluid from the internal passage to the outlet passage, and wherein of said chambers a first valve chamber is connected to the heat transfer means to receive fluid therefrom, a second valve chamber is connected to the fluid heating means to receive heated fluid therefrom, and a third valve chamber is connected to the fluid heating means to return fluid thereto, all in response to the position of the valve in the valve body.

4,907,740

DEVICE FOR ATTACHING A RAIL TO A BEARING ELEMENT

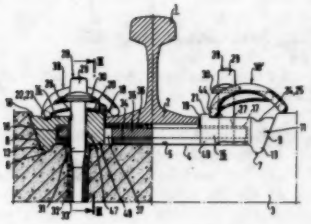
Günter Oberweller, Munich; Johann W. Spies, Ingolstadt; Udo Wirthwein, Creglingen, and Friedhelm Weber, Neuenrade, all of Fed. Rep. of Germany, assignors to Vossloh-Werke GmbH, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,133

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720381

Int. Cl.[4] E01B *9/38*; F01B *9/68*

U.S. Cl. 238—238 **12 Claims**



1. A device for attaching a railroad rail having a foot to a rigid trackway made up of bearing elements, wherein:

(a) two guide plates are provided on each bearing element and are arranged on opposite sides of the foot of the rail to provide lateral guidance of the rail;

(b) a clamp which is tightened by a bolt is provided for each guide plate; the clamp pressing, on the one hand, the guide plate, and on the other hand, the foot of the rail onto the bearing element;

(c) at least one elastic intermediate plate is arranged between the foot of the rail and the bearing element;

(d) the elastic intermediate plate is wider than the foot of the rail in the plane perpendicular to the longitudinal axis of the rail and projects accordingly on both sides of the foot;

(e) the guide plates each possess a recess which is open towards the foot of the rail and into which the elastic intermediate plate projects; and

the guide plates includes a support element in the area of the opening of the recess at the foot of the rail; said support element is in contact with the bearing element, and the force exerted by the clamp is at least substantially transmitted via the support element from the guide plate to the bearing element.

4,907,741

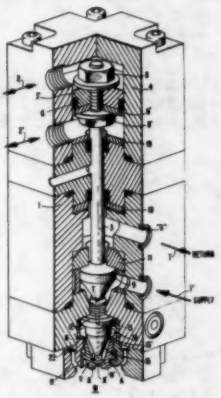
POPPET-VALVE-CONTROLLED FLUID NOZZLE APPLICATOR

Frederic S. McIntyre, Wellesley, Mass., assignor to Acumeter Laboratories, Inc., Marlboro, Mass.

Continuation of Ser. No. 36,269, Apr. 9, 1987, abandoned. This application May 22, 1989, Ser. No. 356,593

Int. Cl.[4] B05B *1/12*

U.S. Cl. 239—124 **15 Claims**



1. A poppet valve-controlled fluid nozzle applicator system having, in combination, a longitudinally extending valve stem reciprocally mounted within communicable upper and lower longitudinally displaced fluid chambers, the lower of which transversely communicates with a pressurized and metered fluid supply source and the upper of which communicates transversely with a fluid return path, the valve stem carrying a poppet valve having upwardly and downwardly converging surfaces and constrained within the lower chamber, the region of communicating of the upper and lower chambers comprising a valve seat against which the upwardly converging surface of the poppet valve may bear to close off the upper chamber from the lower chamber when the valve stem reciprocates to an uppermost position, the downwardly converging surface of the poppet valve terminating in a valve tip; a nozzle mounted to depend from a region of lowermost reciprocation of the valve tip, said nozzle having a first passage therein with an opening at an upper end thereof into which the valve tip may fit to block fluid flow from the lower chamber into said passage when the valve stem reciprocates to a lowermost position, said valve tip engaging a portion of said nozzle surrounding said opening along a line-contact circle the diameter of which has a magnitude that is a minor portion of the magnitude of the diameter of said poppet valve, said nozzle having a second passage therein that is substantially narrower than the first passage, said second passage having an upper end that communicates directly with the lower end of said first passage and having a lower end with a fine bottom orifice through which fluid exits upon elevation of the valve tip from said region of lowermost reciprocation; a dispensing head disposed about said nozzle and having a bottom aperture in substantial alignment with the bottom orifice of the nozzle, said dispensing head having means for adjusting the position of said dispensing head relative to said nozzle within a range of positions from a position at which said bottom orifice of said nozzle is just above said bottom aperture of said dispensing head, through a position at which said orifice and said aperture are substantially flush with one another, to a position at which said orifice is below said aperture, said nozzle having a conical outer surface with an apex region adjacent to said bottom orifice and said dispensing head having a conical inner surface surrounding and spaced from said conical outer surface of said nozzle and

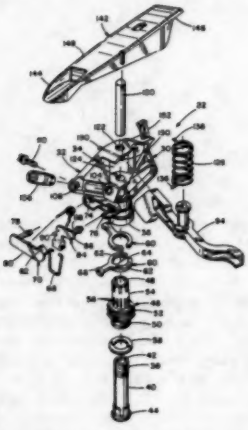
having an apex region adjacent to said bottom aperture; and means for directing air conically convergingly inward in the space between said conical surfaces and thereafter upon fluid exiting from said orifice as the fluid is in free flight therefrom, and in which said nozzle has a cylindrical portion terminating said apex region thereof whereby said conically convergingly inward directed air is redirected along the direction of fluid exiting from said bottom orifice, the diameter of said aperture being greater than the diameter of said cylindrical portion so that said aperture remains open even when said cylindrical portion is within said aperture.

4,907,742

IMPULSE SPRINKLER WITH DEFLECTOR

Stephen P. Whitehead, Elgin, and Michael D. Ferguson, West Chicago, both of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Jun. 29, 1988, Ser. No. 212,779
Int. Cl.[4] B05B *3/08*
U.S. Cl. 239—230 **5 Claims**



1. An impulse sprinkler for step-by-step watering and capable of part-circle operation, said sprinkler comprising:

a base;

a main body including a nozzle for dispensing water and a frame defining a window, said frame including a top wall;

means pivotally mounting said main body on said base enabling said main body to rotate about a substantially vertical axis;

an impulse arm for deflection by water dispensed by said nozzle;

means pivotally mounting said arm on said main body so that said arm extends through said window and is rotatable about said substantially vertical axis;

spring means disposed in said window for biasing said impulse arm to a position wherein it will be deflected by water from said nozzle;

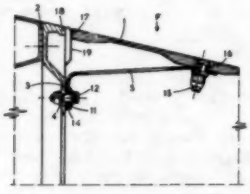
and an elongate deflector pivotally carried by said main body so that said deflector is rotatable about a substantially horizontal axis, said deflector being of one-piece molded thermoplastic construction and including a deflector head overlying said nozzle, a tail portion for grasping by the user, and an intermediate portion supported by said main body, said deflector being pivotable through a range of positions between a maximum deflection position in which said head is adjacent said nozzle and a minimum deflection position in which said head is remote from said nozzle, said main body and said intermediate portion together comprising holding means for holding said deflector in a predetermined one of said positions, said holding means comprising a post extending upwardly from said top wall, said holding means further comprising an opening in said intermediate portion receiving said post, said intermediate portion including an upper wall with a pair of spaced interior arms, dependent from said upper wall, defining said opening and receiving said post in an interference fit.

4,907,743

ASSEMBLY OF TWO BODIES HAVING DISTINCTLY DIFFERENT COEFFICIENTS OF EXPANSION

Jean G. Bouiller, Brunoy; Gérard E. A. Jourdain, Corbeil Essonnes, and Marc G. Loubet, Nandy, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Nov. 10, 1988, Ser. No. 269,725
Claims priority, application France, Nov. 12, 1987, 87 15615
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—265.11 **4 Claims**



1. An assembly consisting of two coaxial bodies of revolution made of materials having distinctly different thermal coefficients of linear expansion, and fixing means securing said two bodies together, wherein said fixing means comprises:

at least three brackets made of a resilient material, each of said brackets having a generally trapezoidal shape whereby said bracket has a larger end and a smaller end, and a flanged edge at said larger end;

a metal ring;

hollow rivets fixing said flanged edge of each of said brackets to said metal ring at at least two points of said flanged edge;

first bolts rigidly fixing said brackets and said metal ring to said body having the higher thermal coefficient of linear expansion through said hollow rivets; and second bolts fixing said smaller end of each of said brackets to the inner surface of said body having the lower thermal coefficient of linear expansion at at least one point of said smaller end.

4,907,744

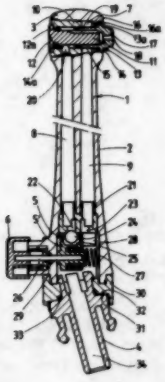
ORAL HYGIENE DEVICE

Pierre-Jean Jousson, Geneva, Switzerland, assignor to Les Produits Asocies LPA-Broxo S.A., Switzerland

Filed May 3, 1988, Ser. No. 189,668
Int. Cl.[4] A61C *17/02*
U.S. Cl. 239—449 **13 Claims**

1. An oral hygiene device comprising a nozzle-holder connectable to a liquid source and a nozzle removably attached to the nozzle-holder, the nozzle comprising a head having a series of holes forming outlet orifices of a first liquid duct and allowing emission of a multi-jet of liquid, and a single hole forming an outlet orifice of a second liquid duct and allowing emission of a single jet of liquid, a two-way valve being provided, controlled by a control member in order to direct the liquid either into the first duct or into the second duct, wherein the said valve (**5, 40, 49, 57, 68, 76**) and therefore branching of the two liquid ducts (**8, 9, 62, 63**) are located in the nozzle itself, and the valve is subjected to the action of a restoring spring (**27, 48, 54, 64, 72, 85**) which is such that the stable position of the device is for emitting the multi-jet of liquid, whilst under the action of an external force exerted on the control member counter to the action of the spring, the device emits the single-jet of liquid, the nozzle head (**3**) having a front face and a rear face and an axial

bore (7) which opens onto the front face forming a front aperture and onto the rear face forming a rear aperture; a spray pin (11, 13) frictionally mounted in the bore (7), the spray pin (11, 13) having a front part and a rear part, the front part being part located in the zone of the front aperture (14), the front part having a boss (17) having the single-jet spray orifice located centrally therein (18) in communication with the second liquid ducts (8) and, the rear part being located in the zone of the rear aperture and having a shut-off piece (12), the rim of the said front aperture (14) and at least one of theperiphery of the front part of the pin being equipped with axial grooves (16) forming



the multi-jet spray orifices (16*a*) in communication with the first liquid duct (9), said spray pin (11, 13) being shiftable between a first and a second position, in first position the rear part (12) of the pin (11, 13) is depressed into the bore (7) and closes the rear aperture (14*a*), the front part (13) of the pin being engaged in the front aperture (14), the single-jet spray orifice and the multi-jet spray orifices (16*a*) being operational, whilst in the second position said shut-off piece (12) is released rearwards under the effect of pressure exerted on the boss (17), and the spray pin (11, 13) is released from the apertures (14, 14*a*), thus freeing the axial grooves (16) and the rear aperture (14*a*).

4,907,745

FUEL INJECTION VALVE AND METHOD FOR ADJUSTING IT

Anton Messingschlager, Staffelbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

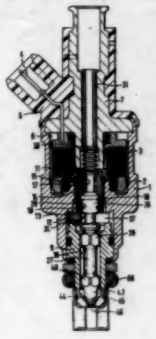
Filed May 20, 1988, Ser. No. 196,521

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723698

Int. Cl.[4] F02M *51/06*

U.S. Cl. 239—463 **8 Claims**

1. A fuel injection valve comprising a housing, a magnet coil disposed in said housing, an armature that can be acted upon by the force of the magnet coil, a nozzle body secured to said housing, said nozzle body including a valve seat having a valve seat face, a valve closing element (27) connected to said armature which in combination with said valve seat face controls an opening or closing of said fuel injection valve, said valve closing element being guided by interior walls of said nozzle body, a plate located downstream of said valve seat, a plurality of injection ports (55) in said plate, said plate and said nozzle body (9) being formed as a single component and said plate being embodied as a thin-walled bottom (50) of said single component and having inner and outer walls 51 and 52, respectively,



said valve closing element terminating upstream of said inner wall of said plate.

4,907,746

INJECTION VALVE

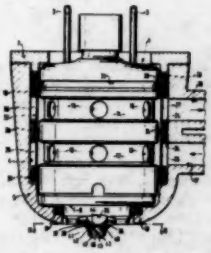
Karl Aichele, Stuttgart; Wolfgang Kramer, Strullendorf; Ernst Lang, Gerlingen; Mathias Linssen, Litzendorf; Alois Stemmer, Vaihingen, and Michael Wissmann, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 438,824, Nov. 3, 1982, abandoned. This application Apr. 23, 1985, Ser. No. 725,522

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121572

Int. Cl.[4] F02M *51/06*

U.S. Cl. 239—472 **3 Claims**



1. An injection valve for fuel injection systems of internal combustion engines, comprising a nozzle body, a movable valve element arranged to cooperate with a fixed valve seat provided in said nozzle body, said nozzle body comprises a guide bore of uniform diameter downstream of said valve seat, said valve seat is adjoined by a fuel collecting chamber and said fuel collecting chamber is adjoined by said guide bore, a swirl insert disposed downstream of said fixed valve seat and supported in said guide bore, said swirl insert including open swirl channels therein which extend towards its circumference and serve as metering channels, said swirl insert protruding partway into the guide bore with a portion extending into said collection chamber and the swirl channels are sloped and extend in an axial direction from an upper end of the swirl insert to a lower end of said swirl insert and discharge in a tangential direction into said guide bore and are slanted toward a longitudinal shaft of the injection valve.

4,907,747

SANITARY CHEMICAL SPRAY APPARATUS

Il Yoo Kim, 7953 Audubon Ave. B-7, Alexandria, Va. 22306

Filed Oct. 14, 1988, Ser. No. 257,879
Int. Cl.[4] B05B *15/10*; B08B *3/10*
U.S. Cl. 239—578 8 Claims

1. A. sanitary chemical spray apparatus which comprises:

a spray gun member containing a spray nozzle device disposed at one end thereof,

a jack member containing a piston and cylinder, connected to the other end of said spray gun member, said piston and cylinder being operable to extend and retract said jack member and the spray gun member attached thereto, and

an on/off switch operatively connected with said spray gun member, said on/off switch being connected to a rod member which is mounted to automatically open the on/off switch when the jack member is extended and automatically close the on/off switch when the jack member is retracted.

4,907,748

FUEL INJECTOR WITH SILICON NOZZLE

Robert C. Gardner, Taylor; Joseph M. Giachino, Farmington Hills; William F. Horn, Plymouth; Mark K. Rhoades, Ferndale; Marvin D. Wells, Redford, and Steve J. Yockey, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 12, 1988, Ser. No. 231,336
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] B05B *1/02*; F16K *31/02*
U.S. Cl. 239—584 5 Claims

1. A fuel injector with a silicon micromachined nozzle includes:

an injector body for supporting components of the fuel injector:

a fuel connection coupled so as to pass fuel from a fuel source to said silicon micromachined nozzle;

a fuel valve means in the fuel flow path of said silicon nozzle for regulating the flow of fuel;

said silicon nozzle being coupled to said injector body and having an opening for passing fuel downstream of said fuel valve means;

said silicon nozzle being a relatively flat silicon plate having a plurality of openings therethrough for passing fuel wherein each of said openings has sides slated from the perpendicular to the major plane of said silicon nozzle plate; and

said silicon nozzle plate including a top silicon plate coupled to a bottom silicon plate, said top plate having a first top opening offset along the major plane of said silicon nozzle

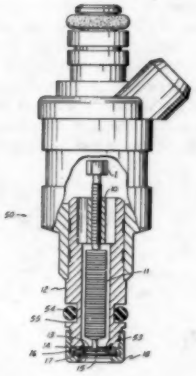


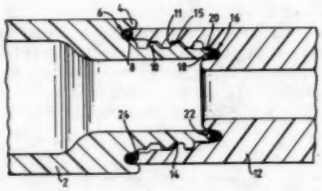
plate from a first bottom opening in said bottom plate thereby forming a compound silicon nozzle.

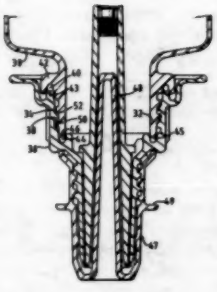
4,907,749

COUPLING

Peter C. Bennett, Green Lane, and Rodney J. Clarke, Selsey, both of England, assignors to Imperial Chemical Industries PLC, United Kingdom

Filed Jul. 19, 1983, Ser. No. 515,266
Claims priority, application United Kingdom, Aug. 18, 1982, 8223723
Int. Cl.[4] B05B *5/00*
U.S. Cl. 239—690 5 Claims





1. A coupling comprising: a first tubular element having an external surface with a thread thereon;

a second tubular element having an interior surface with a

thread thereon, said threads of said first and second tubular elements have radial mating portions and cooperating in threaded engagement;

said first tubular element threaded terminating in a first annular sealing edge;

said second tubular element threaded surface terminating in a second annular sealing edge;

means defining a first sealing groove in said first tubular element at a portion thereof adjacent the end of said external threaded surface opposite said first annular sealing edge, said first sealing groove dimensioned to cooperate in a sealing relationship with said first annular sealing edge; and

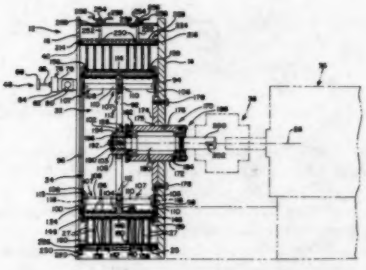
means defining a second sealing groove in said second element adjacent the end of said interior threaded surface opposite said second annular sealing edge, for operative sealing cooperation with said first annular sealing edge.

4,907,750

HAMMERMILL

Horst H. Seifert, Darian, Ill., assignor to Prater Industries, Inc., Chicago, Ill.

Filed Mar. 9, 1988, Ser. No. 165,962
Int. Cl.[4] B02C *13/282*
U.S. Cl. 241—73 **11 Claims**



1. In a hammermill that includes a housing defining a hammermill chamber having a center of gravity, an inlet thereto and an outlet therefrom, a rotor journaled in the housing centrally of the housing hammermill chamber for rotation about an axis that extends substantially normally of the chamber, a screen mounted within the housing radially outwardly of the rotor, with the rotor mounting a plurality of hammers hammermill style and disposed in groups spaced circumferentially of the rotor, with the hammers of each group of hammers having a common pivot axis that extends transversely of the rotor and said pivot axes being spaced equidistantly radially outward of the rotor axis, and with the hammers each being proportioned lengthwise thereof for hammermill style cooperation with the screen on rotation of said rotor, and with the rotor being rotatable about its journaling axis for grinding and screening through the screen for passage to the housing outlet material to be reduced in size that is introduced into the housing inlet,

the improvement wherein:

the housing comprises front, rear and side plates, with said front and rear plates extending normally of the rotor and hammer axes,

said plates being fixed together by bonding means for forming the chamber and for effecting the sealing off of dust emission between same on operation of the hammermill,

with the portions of said rear and side plates defining the chamber being imperforate for precluding dust emission therethrough on operation of the hammermill,

said rotor being journaled in said housing rear plate to the exclusion of said front plate for rotation about the rotor axis,

said rotor being symmetrical about the rotor axis,

with the housing front plate being open coextensively with the radial dimensioning of the rotor and the screen, relative to the rotor axis, to define access opening in the housing to the rotor and screen,

said access opening being centered on the rotor axis, and when open exposing one side of said rotor,

with the portion of said front plate defining the chamber being imperforate about said access opening for precluding dust emission therethrough on operation of the hammermill,

a door proportioned and constructed to close off said access opening in the closed position of said door with respect to said access opening,

hinge means for hinging said door to said housing for swinging said door about a vertical axis between said closed position and an open position wherein said screen and rotor are fully exposed through said access opening in the open position of said door,

means for fixing said door across said housing access opening to close off said housing chamber on operation of the hammermill,

the pivot axis of each of said hammer groups being defined by a pin,

a center tube slip fit mounted on each of said pins on which the hammers of the respective groups are journaled in spaced apart relation longitudinally of the hammer group pivot axis,

with said pins being disposed in substantial parallelism with the rotor rotational axis and presenting like ends at said one side of the rotor,

and including locking means for locking said like ends of said pins to said rotor against withdrawal from the rotor, for rotation of said pins therewith on operation of said hammermill, including means for releasing and locking said locking means that is operable from said one side of said rotor,

whereby, when the hammermill rotor rotation is discontinued and said door is removed from said access opening to expose the hammermill rotor said one side, the individual groups of hammers may be manually replaced through said housing access opening by, for each of the respective hammer groups, operating said release means of said pin thereof, manually removing said pin thereof followed by manual removal such hammer group itself, replacing such hammer group with a preassembled fresh hammer group like arrangement, replacing said pin to operably mount the preassembled hammer group in the rotor, and locking said locking means for locking such pin to the rotor,

the rotor comprising:

a center plate,

and a pair of side plates on either side of said center plate and equally spaced therefrom,

said center plate comprising a radially inner hub portion and a radially outer rim portion, with said center plate portions being in fixed relation,

said side plates both being of open center configuration defining annular rings that are substantially congruent with said center plate rim portion,

said one end of said shaft being keyed to said center plate hub portion for keying said shaft to the rotor,

and with said pins extending between said side plates and said center plate rim portion,

one of said side plates defining said one side of the rotor,

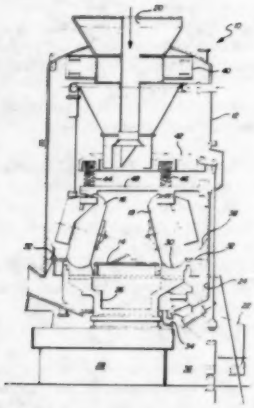
and with the other side of the rotor being adjacent said rear plate,

said bearing extending from said rear plate toward said access opening to adjacent the plane of said center plate hub portion in telescoping relation to the rotor.

4,907,751
ROTATING THROAT FOR COAL PULVERIZER

Rickey E. Wark, Pontiac, and James R. Cunningham, Royal Oak, both of Mich., assignors to Sure Alloy Steel, Warren, Mich.

Filed Oct. 3, 1988, Ser. No. 251,776
Int. Cl.[4] B02C *15/04*
U.S. Cl. 241—119 18 Claims



1. In a vertical pulverizing mill of the type having a housing, a rotating bowl within the housing having a substantially horizontal surface for receiving coarse material to be pulverized, crusher means coacting with the bowl surface for pulverizing the material, inlet means for placing coarse material on the bowl surface and a forced air source for directing air upwardly within the housing around the outer periphery of the bowl surface:

a vane wheel attached to the outer periphery of the bowl to rotate therewith and including a plurality of circumferentially spaced vane plates having essentially parallel upper and lower surfaces which are pitches at an angle to the horizontal, which plates define air flow openings therebetween;

a plurality of vane liners each including the integral combination of an essentially planar primary plate overlying the upper pitched surfaces of the associated vane plate, and a secondary plate which is horizontally disposed within the vane wheel and which overlies the top edge of the vane plate and extends into the air flow opening to affect the effective area thereof;

each of the vane liners being formed of a wear-resistant material; and

means overlying at least a portion of each of said liners for securing said liners in place on said vane plates.

4,907,752
BALL-TUBE MILL

Vasily S. Bogdanov, Belgorod, U.S.S.R., assignor to Materialov Imeni I.A. Grishmanova. Belgorodsky Tekhnologichesky Institut Stroielnykh, Belgorod, U.S.S.R.

Filed Apr. 20, 1988, Ser. No. 183,771
Int. Cl.[4] B02C *17/06*
U.S. Cl. 241—171 1 Claim

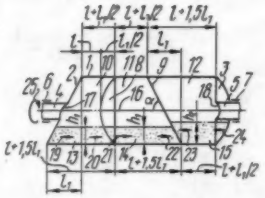
1. A ball-tube mill comprising:

a lined rotatable drum having a longitudinal axis;

a first bottom fixedly mounted on said lined drum for rotation therewith and closing said lined drum at the side of feeding a material being comminuted and inclined with respect to the longitudinal axis of said lined drum and having the form of an ellipse;

a second bottom fixedly mounted on said lined drum for rotation therewith and closing said lined drum at the side of discharging the comminuted material and positioned at an angle to the longitudinal axis of said lined drum and having the form of an ellipse;

two perforated walls fixedly mounted on said lined drum for rotation therewith, each perforated wall having the form of an ellipse and being inclined with respect to the longitudinal axis of said lined drum and angularly offset one with respect to the other about the longitudinal axis by a predetermined amount wherein the first of these two perforated walls is turned in the direction of rotation of said lined drum a predetermined angle with respect to the larger axis of the ellipse of said first bottom, while the second one of the two said perforated walls is turned in the direction of rotation of said lined drum at said predetermined angle with respect to the larger axis of the ellipse of said first perforated wall, while said second bottom is turned in the direction of rotation of said lined drum with respect to the larger axis of the ellipse of said second perforated wall at said predetermined angle, said predetermined amount is



equal to 360°: n, where "n" is a number equal to the sum of the total number of said bottoms and said perforated walls, so that the larger axes of said bottoms and perforated walls are always angularly displaced from each other about said longitudinal axis of said drum;

milling chambers for comminuted material successively disposed with respect to the direction of the comminuted material feed, where a first of said milling chambers is defined by the internal surface of said first bottom, a peripheral surface of said lined drum and a first surface of said first perforated wall, while a second of said milling chambers is formed by the peripheral surface of said lined drum, a second surface of said first perforated wall and a first surface of said second perforated wall, while a third milling chamber is formed by the peripheral surface of said lined drum, a second surface of said second perforated wall and the internal surface of said second bottom; grinding bodies occupying said milling chambers; a charging port positioned in said first bottom; and a discharging port positioned in said second bottom.

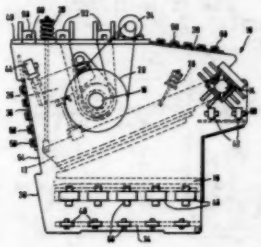
4,907,753
CRUSHER HOUSING

Paul Bohringer, Heuchlingerstrasse 35, D-7101 Oedheim, Fed. Rep. of Germany

Filed Jan. 31, 1989, Ser. No. 304,201
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803497
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—285 R 6 Claims

1. In a crushing machine for the processing of stone, concrete or the like and including a crushing mechanism, the improvement which comprises a modular housing for encompassing said crushing mechanism, said housing comprising a first plate member defining a boundary of said housing and a second plate member disposed generally perpendicular to said first plate member, connection means for removably locking said plate members together, said connection means comprising a series of spaced openings formed in one said plate mem-

ber and a series of complementally spaced lugs formed on the other said plate member, said lugs of said other member extending through said openings of said one plate member and having portions projecting beyond said one plate member, apertures formed in said projecting portions of said lugs, and a



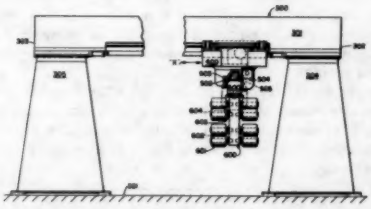
plurality of wedge shaped locking means extending through said apertures, respective opposed surfaces of said locking means being wedged against portions of said lugs defining said apertures, and portions of said one plate member surrounding said openings.

4,907,754

FIBER PLACEMENT MACHINE

Milo M. Vaniglia, Southgate, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 13, 1985, Ser. No. 808,911
Int. Cl.[4] B65H *81/04*
U.S. Cl. 242—7.21 **8 Claims**



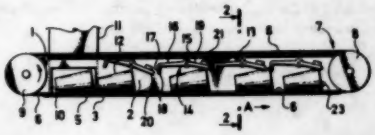
1. In a fiber placement machine, having:
a base; and
a workpiece form-holding means on said base for supporting a workpiece form along a substantially horizontal axis:
an improved fiber delivery assembly, comprising:
a pair of support stanchions affixed to said base;
an elongate horizontal support beam;
beam ways parallel to said horizontal axis;
opposite beam ends supported on said stanchions;
a carriage mounted to said beam ways and depending from said beam;
carriage ways normal to said horizontal axis;
a cross slide assembly mounted to said carriage ways;
means for moving said carriage on said beam ways between said stanchions;
means for moving said cross slide on said carriage ways;
a fiber creel assembly affixed to, and depending from, said cross slide assembly; and
fiber payout means, mounted on said cross slide assembly, for guiding fiber from said fiber creel assembly to said workpiece form.

4,907,755

COP TUBE FEEDING DEVICE FOR TEXTILE MACHINES

Franti ek Bury ek, and Franti ek Hortlík, both of Ústí nad Orlicí, Czechoslovakia, assignors to Y zkumn Ústav Bavlnársk, Ústí nad Orlicí, Czechoslovakia

Filed Oct. 12, 1988, Ser. No. 256,439
Claims priority, application Czechoslovakia, Sep. 2, 1987, 6371-87
Int. Cl.[4] B65H *67/06*
U.S. Cl. 242—35.5 A **9 Claims**



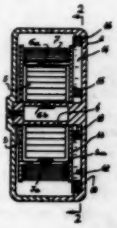
1. A device for feeding cop tubes from a supply container to a withdrawing station of a textile machine, comprising:
a conveying channel extending along and being attached to the textile machine, said channel including a side wall and a lower horizontal support wall having an upper slide surface;
a conveyor being disposed partly in the cross-section of said channel, said conveyor including an endless belt, guided over said slide surface of said channel, for carrying the tubes along said channel to a withdrawing station of the textile machine;
a supply container for depositing the cop tubes onto said endless belt, said supply container having an outlet disposed at the upstream end of said channel and above said endless belt; and
retaining means, at the withdrawing station, for arresting movement of the tubes along said endless belt.

4,907,756

WINDING BRAKE FOR SPRING-RETURN TAPE MEASURE

Andre Bourrat, Saint Etienne, France, assignor to Sam Outillage S.A., Saint Etienne, France

Filed Apr. 25, 1989, Ser. No. 342,837
Int. Cl.[4] B65H *75/48*
U.S. Cl. 242—107.3 **5 Claims**



1. A winding brake for spring-return tape measures comprising:
a case having diametral walls;
a drum disposed inside the case for carrying a graduated tape, said drum comprising a flange opposite one of the diametral wall of the case;

at least one inside cradle integral with said drum;

a housing formed between the one diametral wall of the case and the flange of the drum comprising a cylindrical friction face;

at least one approximately circular elastic tongue each having a first end integral with one of said at least one cradle, and a second end adapted to come into frictional contact with the cylindrical friction face of said housing, said first end being disposed downstream with respect to said second end during winding of the tape; and

at least one weight placed transversely in said housing and radially between the at least one cradle and the second end of the at least one tongue adapted to cooperate with the cylindrical friction face during rotation of the drum during winding and unwinding of the tape.

4,907,757

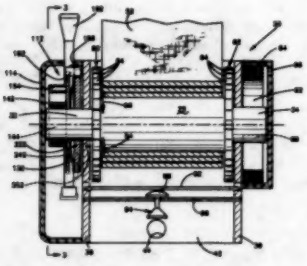
COMFORT MECHANISM WITH SLACK LIMIT

Robert J. Rumpf, Grosse Pointe; Lawrence M. Refior, Attica; Lenard D. Klebba, Romeo, and Steven G. Corrion, Utica, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jun. 14, 1989, Ser. No. 366,851

Int. Cl.[4] B60R *22/34*

U.S. Cl. 242—107.6 **17 Claims**



1. A seat belt retractor comprising:

a spindle having belt webbing wound thereon, said spindle being supported for rotation in belt retraction and belt withdrawal directions;

means for biasing said spindle to rotate in the belt retraction direction;

a rotatable member;

actuatable means having a first condition in which said rotatable member is free to rotate and a second condition in which rotation of said rotatable member by said biasing means is blocked; and

an elongate flexible member having an end portion connected to said rotatable member and another end portion connected to said spindle, said elongate flexible member being (i) wound about a portion of said spindle to a taut condition when said actuatable means is in its first condition to cause said spindle and said rotatable member to rotate together, (ii) unwound upon rotation of said spindle in the belt withdrawal direction when said actuatable means is in its second condition to enable said spindle to rotate relative to said rotatable member, and (iii) rewound about the portion of said spindle to said taut condition to limit rotation of said spindle in the belt retraction direction after withdrawal of the belt webbing from said spindle when said actuatable means is in its second condition.

4,907,758

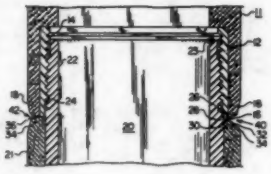
COMPOSITE YARN CARRIER

Stephen S. Powel, 4305 Tallwood Dr., Greensboro, N.C. 27410, and Robert J. Darby, 2517-A Patriot Way, Greensboro, N.C. 27408, assignors to Stephen S. Powel and Robert J. Darby, both of Greensboro, N.C.

Filed Oct. 14, 1988, Ser. No. 258,187

Int. Cl.[4] B65H *75/28*

U.S. Cl. 242—125.1 **14 Claims**



1. A reusable yarn carrier comprising:

(a) a composite hollow tube having an outer, substantially cylindrical laminated paper surface adapted to carry a fibrous or filamentary yarn thereon, an annular, first ring secured to the end portion of the inner surface of said hollow tube, said ring being formed of a rigid material relative to said paper;

(b) a separable end cap having an outer cylindrical surface formed of a wear-resistant material that can withstand the forces exerted by a surface drive mechanism of automatic winding machines, said separable end cap including an annular, second ring means associated therewith;

(c) said first ring and second ring means being joined by mating attachment means for releasably mounting said end cap on at least one end of said hollow tube;

(d) abutting walls of said tube and end cap defining a starting groove therebetween encircling said yarn carrier, said starting groove comprising a relatively narrow locking portion extending partially around said periphery and a relatively wider lead-in portion around the remainder of said periphery;

(e) whereby the lead-in portion guides the first few turns of a waste bunch into the locking portion and said abutting walls of said tube and end cap of said yarn carrier are separable to loosen trapped fibers and facilitate cleaning and reuse.

4,907,759

SPINNING REEL ASSEMBLY

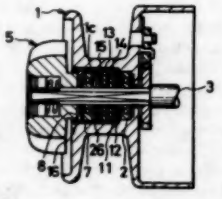
Shinji Takeuchi, and Tetsuya Shimozaki, both of Tokyo, Japan, assignors to Daiwa Seiko Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,798

Claims priority, application Japan, Jan. 22, 1987, 62-8034[U]

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—246 **1 Claim**



1. A spinning reel assembly for use in fishing, comprising:

a spool shaft mounted to a spinning reel casing but movable rearwardly and forwardly;

spool means defining an interior bore for receiving said spool shaft, said interior bore having a first diameter portion and a second diameter portion having a smaller diameter than said first diameter portion, and an outer surface for winding fishline thereon;

anti-friction bearing means comprising a front ball bearing member in said first diameter portion and a rear ball bearing member in said second diameter portion for rotatably supporting said spool means on said spool shaft;

drag plate means mounted in said first diameter portion of said bore by a drag plate securing means including a stop ring mounted on said spool means for securing said drag plate means within said first diameter portion, said drag plate means being disposed between said front ball bearing member and said rear ball bearing member, said drag means being axially slidable but rotatably fixed within said first diameter portion;

drag adjustment means threadedly engaged with said spool shaft and having a portion bearing against said front ball bearing member for applying a variable axial force to said drag plate means;

and means for resiliently biasing said drag adjustment means relative to said spool shaft,

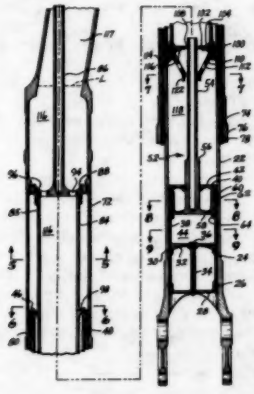
whereby said drag plate means is pressed between said adjustment means and said spool means to brake the spool means against rotation.

4,907,760

CONTRACTING LANDING GEAR SHOCK STRUT

Francis Sealey, Bellevue, and Richard H. Weiland, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 18, 1988, Ser. No. 196,618
Int. Cl.[4] B64C *25/10*
U.S. Cl. 244—100 R **22 Claims**



1. In an aircraft landing gear assembly, a shock absorber comprising:

first and second generally tubular members positioned telescopically with respect to each other;

a floating member carried by said first tubular member and axially slidable with respect to each of said first and second tubular members; said first and second tubular members and said floating member defining a first pressure chamber, a reserve chamber, and a second pressure chamber;

passageway means for providing a metered hydraulic orifice area between the reserve chamber and the first pressure chamber; and

stop means carried by said second tubular member for engaging said floating member and sliding said floating member relative to said first tubular member, when said tubular members retract relative to each other beyond a predetermined position, to reduce the volume of the second pressure chamber;

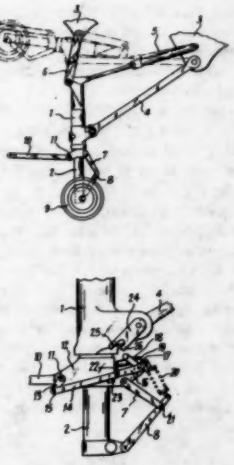
said shock absorber having a first mode of operation in which the volume of the reserve chamber decreases and the volume of the second pressure chamber remains essentially constant as said tubular members retract relative to each other toward said predetermined position, and a second mode of operation in which the volume of the second pressure chamber decreases as said tubular members retract relative to each other beyond said predetermined position.

4,907,761

MECHANISM FOR CONTROLLING A CATAPULT BAR

Michel Derrien, Versailles; Dominique Ducos, Massy, and Jean-Luc Engerand, Sceaux, all of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Dec. 16, 1988, Ser. No. 285,600
Claims priority, application France, Dec. 18, 1987, 87 17746
Int. Cl.[4] B64C *25/10*
U.S. Cl. 244—102 R **8 Claims**



1. A control mechanism for controlling a catapult bar mounted to pivot about a pin carried by a landing gear, the mechanism comprising a crank constrained to rotate with the catapult bar, a catapult bar linkage comprising a link and a lever which are hinged to each other, and having a first end hinged to the crank at a point distant from the pivot pin of the catapult bar, and a second end hinged about a pin carried by the landing gear and distant from the pivot pin of the catapult bar, a return means for returning the link and the lever towards an in-line position including a return spring acting on the link or on the lever, and an abutment for preventing the catapult bar linkage from moving beyond the in-line position, and control means for controlling the relative disposition of the link and the lever; wherein said mechanism is in conjunction with a landing gear including a shock absorber including a strut, a rotary tube mounted to pivot relative to the strut, a rod slidably mounted relative to the rotary tube and to the strut, and a torque linkage having a top arm hinged to the rotary tube and a bottom arm hinged to the rod, wherein the return spring is disposed between one of the arms of the torque linkage and a facing portion of the catapult bar linkage.

4,907,762

LUGGAGE RACK FOR VEHICLES, ESPECIALLY AIRCRAFT

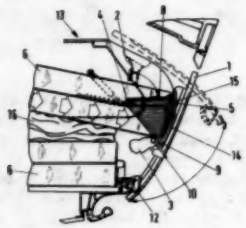
Thomas Bock, Aussone, and Günther Schwertfeger, Tournefeuille, both of France, assignors to Deutsche Airbus GmbH

Filed Dec. 5, 1988, Ser. No. 280,129

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741164

Int. Cl.[4] B24C *1/20, 1/22*

U.S. Cl. 244—118.1 10 Claims



1. A luggage rack for a vehicle, arranged in a longitudinal direction of the vehicle and in an overhead configuration with respect to passengers, comprising

separation walls provided so as to subdivide the rack into individual compartments;

a lid provided so that the individual compartments can be respectively closed off, the lid being swivelable upward and having arms arranged on its sides, the arms being rotatably articulated at bearings provided at the separation walls; and

a safety flap oriented towards the inside of the lid and additionally supported at the bearings, the safety flap being retainable in a locked position by means of a spring fastened at the separation wall so as to secure pieces of luggage when the lid is opened, the safety flap also being displaceable upwards into a position releasing the pieces of luggage with a slight manual force application and with the help of the spring traveling beyond dead center, the safety flap being returnable into the locked position by driving means arranged at an arm of the lid, all this by a closing motion of the lid downwards.

4,907,763

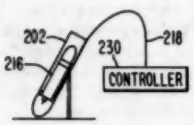
OPTICAL FIBER GUIDED TUBE-LAUNCHED PROJECTILE SYSTEM

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 32,448, Mar. 31, 1987, Pat. No. 4,770,370. This application May 17, 1988, Ser. No. 195,621

Int. Cl.[4] F41G *7/32*

U.S. Cl. 244—3.12 21 Claims



1. An optical fiber guided tube-launched projectile system comprising:

a generally tubular launcher having a base end, a launch end, and an internal peripheral surface;

a generally tubular projectile having a trailing end and being positionable in said launcher with said projectile trailing end proximate said launcher base end;

an extended length of optical fiber disposed in said projectile for continuous streaming from the trailing end during flight of said projectile, a portion of said fiber extending from the trailing end of said projectile and including a free end for operative connection to a controller;

relief means formed in said inner peripheral surface of said launcher and extending from a position adjacent the projectile trailing end to said launch end for removeably receiving part of said extending fiber portion; and

means in said projectile connected to another end of said fiber for data communication through said fiber.

4,907,764

INFRARED RADIATION POWERED LIGHTWEIGHT AIRCRAFT

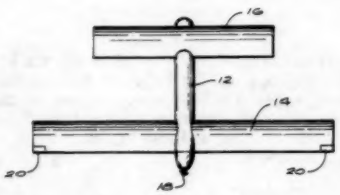
David E. Long, 6666 Glade Ave., Canoga Park, Calif. 91303

Filed Jun. 8, 1988, Ser. No. 204,019

The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.

Int. Cl.[4] B64D *27/24*

U.S. Cl. 244—62 20 Claims



1. A high altitude, ultralight aircraft requiring no fuel comprising:

an aircraft having wings with broad area lower wing surfaces and a fuselage;

a low speed propeller mounted on said aircraft;

electric motor means mounted on said aircraft and coupled to drive said propeller;

long wavelength infrared (LWIR) responsive cell means for receiving infrared energy radiated from the earth and for supplying electricity to power said motor means, said LWIR cell means being mounted on the lower surfaces of said wings and said fuselage; and

said LWIR being substantially the only source of input power for said aircraft to provide a continuous source of power both during the day and at night;

whereby the aircraft may have a life at elevated altitudes of several years.

4,907,765

WALL WITH A DRAG REDUCING SURFACE AND METHOD FOR MAKING SUCH A WALL

Ernst H. Hirschel, Zorneding; Hubert Fleckenstein, Grasbrunn, and Peter Thiede, Ganderkesee, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 911,292, Sep. 24, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 183,330

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534293

Int. Cl.[4] B64C *21/10*

U.S. Cl. 244—200 37 Claims

1. A wall having a drag reducing surface configuration to be contacted by a fluid, comprising a wall structure made of fiber composite material including reinforcing fibers embedded in a resin matrix material, said wall structure having sharp edged ridges separated by valleys, and wherein said resin matrix

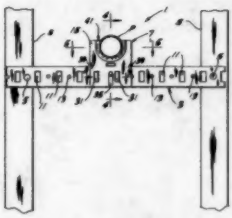
material is recessed in said valleys so that said fibers extend into said sharp edged ridges and are at least partially exposed at least along said ridges for an increased resistance against wear and tear.

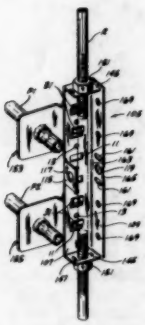
4,907,766

PIPE POSITIONING AND SUPPORT SYSTEM

Eric R. Rinderer, Highland, Ill., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Jan. 24, 1989, Ser. No. 301,318
Int. Cl.[4] F16L 3/22
U.S. Cl. 248—57 **51 Claims**





1. A system for positioning and supporting an elongate member, such as pipe or conduit, in fixed position, comprising

a support bar adapted to be secured to one or more structural elements, said support bar having a first plurality of openings therein spaced at regular intervals lengthwise of the bar and a second plurality of openings therein spaced at regular intervals lengthwise of the bar,

a bracket adapted to be affixed to said support bar in a selected position lengthwise of the bar, said bracket comprising a thin flat bracket member of one-piece construction formed from sheet metal and having an opening therein for receiving said elongate member,

at least one lug integral with the bracket member, said lug being generally L-shaped and having an inner portion projecting outwardly from one face of the bracket member and an outer portion extending from the inner portion and spaced from and generally parallel to said one face of the bracket member, said lug being adapted to be inserted through a selected opening of said first plurality of openings and the bracket then moved relative to the support bar from a preliminary position to a final position wherein said outer portion of the lug extends beyond said selected opening and overlaps the bar with a marginal edge portion of the selected opening received in the space between the outer lug portion and the bracket member, and

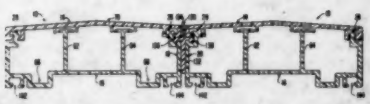
a locking member integral with the bracket member and adapted for movement through an opening of said second plurality of openings in said support bar when the bracket is in said final position thereby to prevent the bracket from being moved relative to the bar back to said preliminary position, the arrangement being such that the bracket is affixed to the support bar in a selected longitudinal position with respect to the bar without the use of separate fasteners.

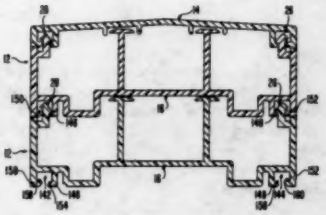
4,907,767

STACKABLE MODULAR DUCT ASSEMBLIES

Paul J. Corsi, Terryville, and Richard H. Russell, Farmington, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Aug. 12, 1988, Ser. No. 231,521
Int. Cl.[4] H02G 3/04
U.S. Cl. 248—49 **18 Claims**





1. A duct assembly for enclosing conduits, the combination comprising:

a base, having a generally uniform cross section along its longitudinal axis, including a central portion and a pair of opposed side walls extending substantially perpendicular to said central portion;

a cover, having a generally uniform cross section along its longitudinal axis, including an intermediate portion and a pair of generally parallel end portions extending substantially perpendicular to said intermediate portion; and

means, coupled to said side walls and said end portions, for releasably coupling said cover to said base,

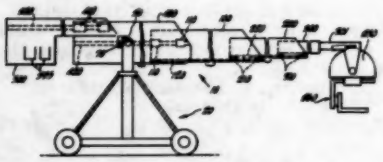
said means for releasable coupling including complementary coupling means of each of said side walls and said end portions for selectively coupling said base and said cover in first and second spaced, but coupled positions,

each of said complementary coupling means comprising abutment means for resisting relative outward movement of said cover and said base by interlocking engagement when in said first coupled position, and for resisting relative outward movement of said cover and base by interlocking engagement when in said second coupled position,

one of said side walls being coupled to one of said end portions and the other of said side walls being coupled to the

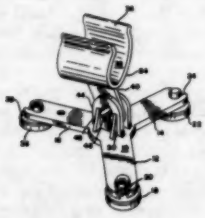
other of said end portions for defining a recess between coupled side walls and end portions when in said first coupled position, and for forming a substantially continuous, smooth, outer surface between coupled and contiguous side walls and end portions when in said second coupled position.

4,907,768
TELESCOPING CRANE
Alain O. F. Masseron, 15 rue Collet, Palaiseau, France (91120), and Jean-Pierre M. Lavalou, 1636 Arteique Rd., Topanga, Calif. 90290
Filed Jul. 14, 1987, Ser. No. 73,282
Claims priority, application France, Feb. 25, 1987, 87 02480
Int. Cl.[4] B66C *23/72*
U.S. Cl. 248—123.1 41 Claims



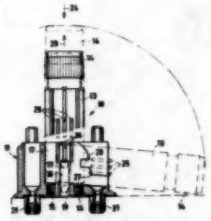
1. A crane comprising:
a fulcrum support;
a main boom mounted on said fulcrum support, said main boom having a front end and a rear end;
a first beam telescopically extendable from the front end of said main boom;
a second beam telescopically extendable from said first beam;
a counterweight structure connected along the outside of the main boom and telescopically extendable out from the rear end of said main boom;
an interconnecting means between said main boom, said first beam, said second beam, and said counterweight structure controlling the relative movements thereof such that as said first beam and said second beam extend in one direction, said counterweight structure extends in the opposite direction thereby substantially maintaining balance about said fulcrum support.

4,907,769
FLASHLIGHT HOLDER
Eugene C. Hunley, Jr., Rogers, Ak.; Eddie W. Derryberry, Greenwood, S.C.; Charles D. Wachs, Montgomery, Ala.; David A. Patton, and Richard L. Bennett, both of Tallassee, Ala., assignors to dreEDco, Inc., Tallassee, Ala.
Filed Nov. 4, 1988, Ser. No. 267,389
Int. Cl.[4] F16H *11/10*
U.S. Cl. 248—185 1 Claim



1. A flashlight holder comprising:
(a) a plurality of legs connected to form a tripod;
(b) a bracket connected to the tripod;
(c) a clamp having a C-shaped portion;
(d) an arm connected to the clamp and adapted to be connected movably to the bracket;
(e) means for locking the arm in a fixed position with respect to the bracket; and
(f) a plurality of magnet mounts, one of each of the magnet mounts connected to one of each of the legs to secure the tripod to a ferromagnetic surface, each of the magnet mounts including a substantially cylindrical permanent magnet having a cylindrical portion removed on an axis of the magnet to form a first hold, a ferromagnetic disc having an outer diameter substantially equal to a diameter of the permanent magnet and having a circular portion removed to form a second hole that is larger than the first hole, and a plastic ball having a shoulder and a stud, the shoulder and stud having cylindrical symmetry about a center line, the plastic ball having a partially spherical portion with a diameter along the center line, the stud sized to clear the second hole and make an interference fit with the first hole to hold the magnet mount together.

4,907,770
TUCK-UP FOOT FOR FURNITURE
Sergio Marchetti, Rho, Italy, assignor to Camar S.p.A., Figino Serenza, Italy
Filed Nov. 7, 1988, Ser. No. 267,998
Claims priority, application Italy, Nov. 13, 1987, 22641 A/87
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—188.6 6 Claims



1. A foot for furniture comprising:
(a) a device for stably fixing to the underside of the furniture the foot wherein said device restrains the foot in a first vertical position to support the furniture or in a second substantially horizontal position adjacent to the underside of the furniture for storage;
(b) a disengageable locking means of said device for stably locking said foot in said first vertical position wherein said locking means includes a first coupling with grooved profiles comprising a male portion formed at the top of said foot and a female portion forming part of a seat for said foot in said device; and
(c) a pair of diametrically opposed grooves in said seat in which respective pins of the foot latchingly engage to provide rotational and translational movement of the foot.

4,907,771
HANGER WITH IMPROVED POSITIONING STRUCTURE
Wen-Mu Wang, 4-1F., No. 381, Sec. 5, Nangking East Rd., Taipei, Taiwan
Filed Mar. 1, 1989, Ser. No. 317,406
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—222.1 1 Claim

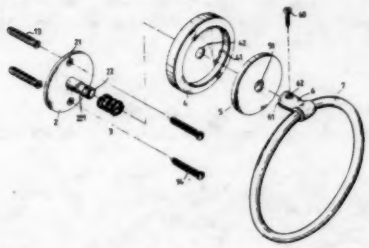
1. A flexible hanger having an improved installation, which comprises:
a brass mounting plate including a flat disc with a stem extending from its center and holes for fastening said

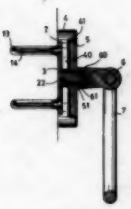
mounting plate onto a wall surface by flat head screws, said mounting stem having an axle of unequal caliber and a longitudinal hole,

a brass cover plate covering said mounting plate and having a circular recess for receiving a decorative ceramic plate,

a spring positioned around said mounting stem between said mounting plate and said cover plate, said spring pressing against said mounting plate and said cover plate, and

a connector holding said cover plate along said mounting





stem, said connector having one end with a hanging device thereon and another end receiving said mounting stem and attached to said mounting stem by a pivot flat head screw passing through said longitudinal hole of said mounting stem, said pivot screw being arranged with said mounted stem so that action of said spring permits flexing between said connector, said mounting plate and said cover plate about said mounting stem for preventing said flat head screws from breaking away from said wall surface.

4,907,772

UNIVERSAL CLAMP FOR AQUARIUM TANK

Allan H. Willinger, Oakland, N.J., assignor to Willinger Brothers, Inc., Oakland, N.J.

Filed Jul. 5, 1988, Ser. No. 215,238

Int. Cl.[4] A47B 96/06

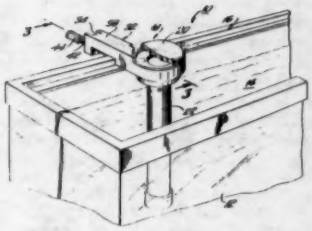
U.S. Cl. 248—231.7 **11 Claims**

1. An aquarium accessory for removable attachment to the top rim of an aquarium tank, comprising:

an instrument;

coupling means connected to the instrument, said coupling means comprising clamping means for securing to the rim, and means for biting into the rim upon securement by said clamping means, said clamping means and said biting means being applied to two opposite sides of said rim and acting on said rim in two opposite horizontal directions,

said coupling means comprising an inverted U-shaped member having opposing walls and an interconnecting bridge, said clamping means associated with at least one of said walls,



said biting means comprising a grating surface on one of said walls; and

locking means for locking the grating surface on to said wall.

4,907,773

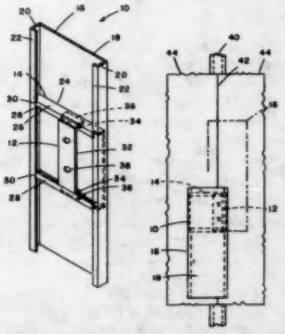
ADJUSTABLE MOUNTING SURFACE

Robert J. Menchetti, Buffalo, and Robert M. Chapman, Lockport, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Aug. 15, 1988, Ser. No. 232,199

Int. Cl.[4] F16M 13/00

U.S. Cl. 248—287 **13 Claims**



6. A wall structure comprising vertical wall framing members, a plurality of vertically disposed wallboards affixed to said framing members, at least one adjustable mounting surface assembly affixed to said wall framing member, and a wall cabinet mounted on said wall, said adjustable mounting surface assembly comprising a metal bracket and at least one rearwardly opening channel, said at least one channel including one channel having a horizontally extending disposition, means on said metal bracket for affixing said bracket to a wall framing member, said bracket having a pair of means located respectively at the top and the bottom ends of said bracket for adjustably engaging said one horizontally extending, rearwardly opening channel, said one horizontally extending, rearwardly opening channel having a front face substantially equal in width to the height of said bracket, rearwardly extending elongate side flanges along the top and the bottom edges of said one horizontally extending rearwardly opening channel, and inwardly extending elongate back flanges extending inwardly from the rearward edges of said side flanges, said adjustably engaging means on said bracket being disposed between said one horizontally extending, rearwardly opening channel front face and said back flanges, at least one of said rearwardly opening channels having a mounting surface for wall furniture, which said mounting surface is mounted for

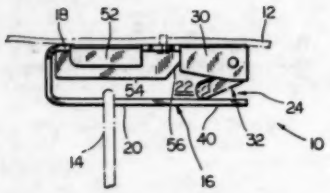
adjustable positioning relative to said bracket by reason of said adjustable engagement of said horizontally extending, rearwardly opening channel on said top and bottom ends of said bracket, said at least one rearwardly opening channel being free of any element extending rearwardly of said inwardly extending elongate back flanges whereby said channels are able to be adjustably mounted closely adjacent a wall surface with said back flanges closely adjacent said wall surface, said cabinet having wall mounting means which are located at and mounted on said mounting surface on one of said rearwardly opening channels.

4,907,774

HANGER SUPPORT DEVICE

Anthony J. Shaw, Chappaqua, N.Y., and Lawrence W. Paricio, Wayne, N.J., assignors to D. Klein & Son, Inc., Lodi, N.J.

Filed Dec. 19, 1988, Ser. No. 286,623
Int. Cl.[4] F16B *45/00*
U.S. Cl. 248—306 **14 Claims**



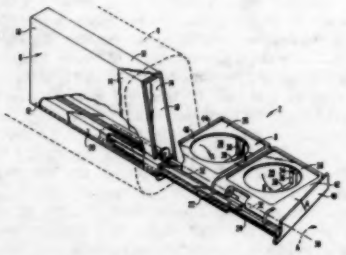
1. An improved hanger support apparatus comprising a U-shaped frame having a pair of parallel and spaced apart legs terminating in a pair of opposed ends, a latch arm pivotly mounted to the first of said legs proximate the end thereof and having a distal end adapted to contact said second leg at a point inwardly from the end thereof; spring means mounted to said latch arm for biasing said arm into said contact with said second leg, and a handle operatively connected to said latch arm to permit said latch arm to be selectively pivoted away from said second leg, said legs having opposed interior surfaces, and the latch arm disposed between said opposed surfaces.

4,907,775

CONTAINER HOLDER

Brian S. Lorence, Warren, and Richard A. Phelps, Ferndale, both of Mich., assignors to Chivas Products Limited, Sterling Heights, Mich.

Filed Feb. 17, 1989, Ser. No. 312,086
Int. Cl.[4] A47C *7/62*
U.S. Cl. 248—311.2 **18 Claims**



1. A container holder for use with a support, the container holder comprising:

a housing including an elongated vertical slot defining a generally vertical plane, and means for mounting said housing to the support;

a guide slidable within said slot along an axis and extendable outwardly of said elongated vertical slot in an operational position; and

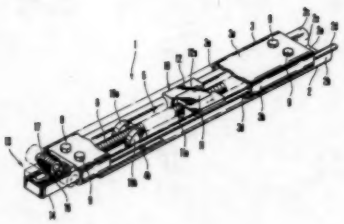
a frame including an integral member having an opening for holding a container formed within said integral member, said frame being pivotally disposed on said guide for movement between a vertical, storage position, generally parallel to the vertical plane of said slot, and a horizontal, operation position, generally perpendicular to the vertical plane of said slot, said integral member receiving a container within said opening when said frame is in the operational position.

4,907,776

SEAT ADJUSTING DEVICE

Akira Nemoto, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 230,968
Int. Cl.[4] B60N *1/08*
U.S. Cl. 248—430 **11 Claims**



1. A seat adjusting device, comprising:

a lower rail fixed to a floor;

an upper rail slidably fitted to said lower rail such that said upper fail is slidingly movable along a longitudinal direction of said lower rail, said upper rail being fixed with a seat;

a lead male screw disposed in a space defined between said lower and upper rails, extending therein in a longitudinal direction of said two rails, said lead male screw being rotatably supported at one of said lower and upper rails;

a female screw block fixedly provided at the other of said lower and upper rails;

said lead male screw being partially in a threaded engagement with said female screw block;

a drive mechanism for causing rotation of said lead male screw, said drive mechanism being connected with said lead male screw with such an arrangement that it is disposed externally of said space between said lower and upper rails and fixed at said one of said lower and upper rails where said lead male screw is rotatably supported; and

at least a pair of rollers within said space between said lower and upper rails, such that they are disposed symmetrically in relation to an axial direction of said lead male screw for supporting said lead male screw from both sides.

4,907,777

BOOKHOLDER FOR RECLINED READING

Richard M. Stewart, 236 Central Rd., Middlebury, Conn. 06762

Filed Jan. 2, 1987, Ser. No. 221
Int. Cl.[4] A47B *23/00*
U.S. Cl. 248—453 **9 Claims**

1. A bookholder for reclined reading of a book, comprising,

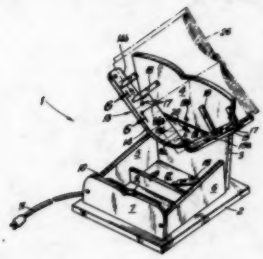
a base member, comprising an open box structure,

a backwall member attached to and supported by said base

member and having a planar surface extending upwardly from said base member,

an illuminating device disposed within the protective confines of said open box structure and arranged for illuminating the pages of said book,

a support arm assembly attached to said backwall member, said support arm assembly including first and second support arms disposed at a right angle to one another and defining first and second ledges respectively extending from said planar surface and adapted to support a bottom



edge and one side edge, respectively, of said book when it is open, said first arm being inclined at a selected angle to the horizontal, and

a plurality of holding means disposed on said arms adapted to be selectively positioned on said arms for holding said book on said ledges according to size and thickness of said book and adapted to hold the pages in place while permitting turning of the individual pages,

whereby a reclined reader may view the book with eyes sweeping parallel to said first arm at said selected angle.

4,907,778

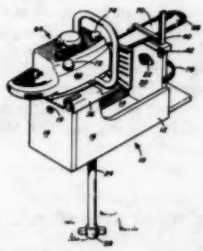
COMBINED ACCESSORY CARRIER AND SERVICE STAND FOR A CHAINSAW

Martin V. Rockwell, 55 VanKirk Rd., Washington, Pa. 15301

Filed Nov. 28, 1988, Ser. No. 276,958

Int. Cl.[4] F16M *1/00*

U.S. Cl. 248—676 **17 Claims**



1. A combined accessory carrier and service stand for a chainsaw having a cutting chain and chain bar extending from a power head comprising:

a box-like body having a bottom, two side walls, a first end wall and a second end wall;

an elongated member selectively securable to said first and second end walls to serve as a handle for said body or selectively securable to said body bottom to serve as a vertical support pole for said body;

ground engaging means to support said elongated member when said elongated member is positioned to serve as a support pole for said body;

a chainsaw power head support table top hingedly secured to said body adjacent said first end wall; and

clamp means hingedly secured to said body adjacent said second end wall, said clamp means having a first fixed clamp member and a second fixed clamp member oriented at 90° to each other and cooperating with a pivoting clamp member to selectively clamp said chainsaw chain bar in either a vertical position against said first fixed clamp member or in a horizontal position against said second fixed clamp member as said chainsaw power head is supported on said support table top.

4,907,779

ELECTRO-MAGNETICALLY OPERATED VALVE DEVICES

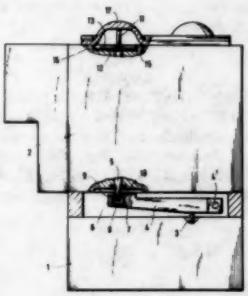
Michael Dettmers, Kamen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,381

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823681

Int. Cl.[4] F16K *31/10*

U.S. Cl. 251—129.18 **12 Claims**



1. An electro-magnetically operated valve device comprising a housing containing a valve with an actuator stem, an electro-magnet with an axially displaceable rod-like armature, a pivotable actuating lever displaced by the armature to move the actuator stem axially, and an adjustment mechanism composed of an adjustment member in screw-threaded engagement with the lever, the armature being locked for rotation with the adjustment member with an end of the armature remote from the lever being accessible for rotational adjustment.

4,907,780

COMBINED SEAL AND ACTUATOR SUPPORT

Edwin D. Phillips, 700 Cedar Ave., Middlesex, N.J. 08846

Filed Apr. 27, 1988, Ser. No. 186,928

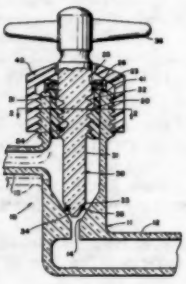
Int. Cl.[4] F16K *41/00, 31/50*

U.S. Cl. 251—214 **7 Claims**

1. In a valve having a valve body with an inlet and an outlet, a valve seat between the inlet and outlet, and a valve member carried by an actuator shaft for movement toward and away from the valve seat, the improvement comprising:

an elongate, combined seal means and actuator support sleeve engaged in said housing between said actuator shaft and the housing for effecting a seal between the shaft and housing and for supporting the actuator shaft for actuation in the housing, said support sleeve having a portion with threads therein engaged with complemental means on the actuator shaft to effect movement of the shaft toward and away from the valve seat when the shaft is turned in the sleeve, and an unthreaded portion slidably and sealably engaged with said shaft to effect a seal and support for said shaft, said sleeve having one end engaged against an end

of said body and held clamped thereto by a retaining nut engaged on said end of said body, and said seal means including an annular channel in said one end of the support sleeve, with a resilient ring means engaged therein to



impart a residual bias thereto and maintain said one end in sealing engagement with the body and with the actuator shaft when the retaining nut is tightened against said one end of said sleeve.

4,907,781

LOW PRESSURE HOISTING AIR CUSHION HAVING AN AIRTIGHT CHAMBER WITH A VENTING MECHANISM

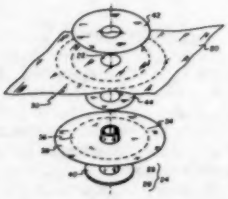
Manfred Vetter, Zuelpich, Fed. Rep. of Germany, assignor to Vepro GmbH, Zuelpich, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 13,666

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604435

Int. Cl.[4] B66F *3/24*

U.S. Cl. 254—93 HP **8 Claims**



7. In a low pressure hoisting air cushion with a hermetically sealed chamber, a wall of the cushion consists of a fabric covered by a rubber-like material and to a shell of which is attached a valve containing a nozzle, in which said nozzle consists of a tube-shaped valve socket inserted through an aperture in the cushion wall and a ring-fastener attached to said valve socket at an inner side of said wall, an improvement comprising a compensation ring which is of greater external diameter than the ring fastener, wherein the compensation ring is composed of at least two perforated disks which form a bellows, and wherein said compensation ring exhibits

a lower and an upper side,

one said perforated disk including a ring-shaped first surface on the lower side whereby the compensation ring is fixed to said ring-fastener by vulcanization,

a second said perforated disk including a ring-shaped second surface on the upper side of the compensation ring whereby the compensation ring is fixed to the inner surface of the wall surrounding an aperture, and

a ring-shaped compensation area between said first and second ring-shaped surfaces, on which the compensation ring is linked neither with the wall nor with the nozzle.

4,907,782

TENSIONING STRINGING DAVIT FOR POWER LINES

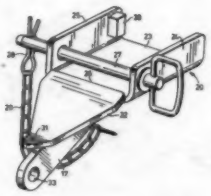
Jurrien Hoekstra, P.O. Box 396, 36 King Street, Tottenham, Ontario, Canada L0G 1W0

Filed Jul. 6, 1988, Ser. No. 215,768

Claims priority, application Canada, Jul. 20, 1987, 542,487

Int. Cl.[4] B65H *59/00*

U.S. Cl. 254—134.3 PA **7 Claims**



1. A davit for use in the tension stringing of power lines, the erection of utility poles, and maintenance of power transmission lines, the davit being adapted to be mounted directly on an insulator stand-off bracket having upper and lower plate-like arms extending from a utility pole to which it is secured, the davit comprising:

a channel-shaped plate member having a base portion with a pair of upturned, longitudinally extending, side flanges defining a floor area therebetween, the floor area being of a width to receive and accommodate the lower arm of a stand-off bracket,

a rigid arm member fixedly attached to the underside of said base portion and projecting longitudinally therefrom beyond one end of said base portion,

a gusset plate rigidly attached to said one end of the base portion and to an upper edge of the projecting portion of said arm member,

a securing pin,

said side flanges providing a pair of transversely aligned holes positioned to receive the securing pin such that the pin extends across the lower arm member of the bracket when the davit is mounted on the arm member,

means for locking the pin in the securing position,

said davit providing longitudinally spaced first and second abutment means for restricting movement of the davit along the lower arm of the bracket, and

said projecting portion of the rigid arm member providing means for attaching a gang traveller, temporary side guy cables, or link stick thereto.

4,907,783

CHAIN LINK FENCE EDGING AND TRIMMING ATTACHMENT

Phillip L. Fisk, and Beth A. Fisk, both of 1920 W. 61st Pl. South, Tulsa, Okla. 74132-1366

Filed Aug. 15, 1988, Ser. No. 232,177

Int. Cl.[4] B21F *27/00*

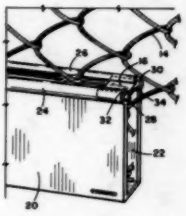
U.S. Cl. 256—32 **9 Claims**

1. A chain link fence lower edging strip comprising:

(a) an elongated substantially flat strip of extruded plastic adapted to fold about the bottom of the wire mesh of a chain link fence and extend vertically upward, during use, from the bottom of the fence wherein said flat strip of extruded plastic has at least one groove of reduced thickness extruded longitudinally substantially along the middle of said flat strip and thus forming at least one precreased hinge for forming a substantially U-shaped config-

uration about the bottom of the wire mesh of a chain link fence during use and wherein the outer edges of said flat strip of extruded plastic form a pair of substantially continuous profile fastener means for engaging a plurality of connector means that hold said flat strip of extruded plastic in a folded U-shape configuration during use; and

(b) a plurality of connector means, each of a length substantially corresponding to the thickness of the wire mesh of a chain link fence and each having a pair of fasteners at



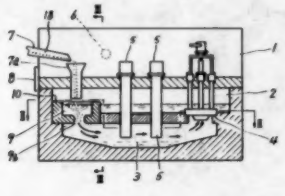
opposite ends compatible with locking engagement to said continuous profile fastener means extruded on the outer edges of said flat strip of extruded plastic, for insertion through the opening in the wire mesh of a chain link fence and for simultaneous engaging to said pair of continuous profile fastener means for holding said flat strip of extruded plastic in a folded U-shaped configuration during use for adjustably sliding along said continuous profile fastener means during use to accommodate movement of a chain link fence.

4,907,784

APPARATUS FOR SUCCESSIVELY FUSING SMALL PARTICLES OF NONFERROUS METAL

Kazuo Kusaka; Shigeo Suehiro; Noboru Tajiri; Kiyoshi Nakamura, all of Hiroshima, and Tsuyoshi Okimoto, Aichi, all of Japan, assignors to Sanken Sangyo Kabushiki Kaisha, Hiroshima and Aishin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Nov. 16, 1988, Ser. No. 272,116
Claims priority, application Japan, Nov. 17, 1987, 62-291607
Int. Cl.[4] C22B 9/16
U.S. Cl. 266—235 **8 Claims**



1. An apparatus for fusing small particles of nonferrous metal comprising:

a molten metal chamber for containing a molten metal formed from a metal raw material which was subjected to heating and fusing treatment;

a fusing chamber for fusing small particles of nonferrous metals by introduction of the particles into a high temperature molten metal;

a molten metal tank contained within said fusing chamber and provided adjacent to said molten metal chamber;

a pump provided in the fusing chamber for circulating molten metal between the molten metal chamber and the fusing chamber;

a delivery pipe connecting an outlet port of the pump with the molten metal chamber by penetrating the molten metal tank; and

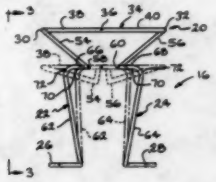
a cylindrical swirl generation chamber provided in the fusing chamber at a suction side of the pump, said swirl generation chamber having a circular inner peripheral wall, an introduction passage extending tangentially to a side surface thereof and a discharge port of circular cross section provided substantially at the middle of a bottom surface thereof.

4,907,785

LIMITED DEFLECTION SPRING

Upton R. Dabney, Georgetown, Ky., assignor to Hoover Group, Inc., Roswell, Ga.

Continuation of Ser. No. 237,846, Aug. 29, 1988, abandoned. This application Aug. 22, 1989, Ser. No. 397,630
Int. Cl.[4] F16F 3/02
U.S. Cl. 267—104 **3 Claims**



1. A limited deflection spring for a box spring assembly comprising:

a wire body having an upright yieldable portion and a load bearing portion at the upper end of said upright portion, said load bearing portion being substantially horizontal and having a pair of ends, said upright yieldable portion comprising a pair of downwardly extending converging connecting bars integral at their upper ends with opposite ends of said load bearing portion, a pair of lower torsion bars at the lower ends of said connecting bars, said lower torsion bars extending transversely of said connecting bars, a pair of downwardly extending and converging wire columns located at their upper ends outwardly of said lower torsion bars, wherein the upper end of one column is connected to one end of one lower torsion bar by wire sections and the upper end of the other column is connected to the opposite end of the other lower torsion bar by wire sections so that during deflection of said yieldable portion, said lower torsion bars are inclined downwardly in relatively reverse directions, a pair of substantially horizontal mounting feet integral with the lower ends of said converging wire columns and located beneath said load bearing portion, said feet being located in a horizontally spaced relation, said connecting wire sections including downwardly curved portions providing moment arms to partially transfer torsional stresses from said lower torsion bars to said columns so that a downwardly directed load applied to said load bearing portion causes said converging wire columns to move toward vertical positions and said torsion bars to move downwardly and inwardly thereby limiting further deflection of said spring, said spaced feet enabling said converging wire columns, as they move toward said vertical positions due to said downwardly directed load to remain spaced as said spring is fully deflected.

4,907,786

FLUID-FILLED ELASTIC MOUNT HAVING PARTITION MEMBER WHICH INCLUDES A DOUBLE-LAYERED SECTION

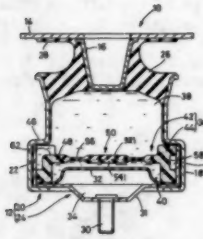
Masaaki Okazaki, Inuyama, and Itsuro Kadomura, Kasugai, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan

Filed Aug. 24, 1988, Ser. No. 235,558

Claims priority, application Japan, Aug. 28, 1987, 62-132205[U]

Int. Cl.[4] F16F *13/00*

U.S. Cl. 267—140.1 9 Claims



1. A fluid-filled elastic mount including (a) a first and a second support member which are spaced apart from each other, (b) an elastic body disposed between the first and second support members for elastically connecting these support members, (c) a closure member supported by said second support member and cooperating with the second support member and the elastic body to define a fluid chamber which is filled with a non-compressible fluid, the closure member including a flexible portion, (d) a partition member supported by the second support member and dividing said fluid chamber into a pressure-receiving chamber on the side of said elastic body and an equilibrium chamber on the side of said closure member, and (e) means for defining a restrictor passage for restricted fluid communication between said pressure-receiving and equilibrium chambers, said fluid-filled elastic mount comprising:

said partition member including an integrally formed member which has a thick-walled outer portion and a thin-walled inner portion inside said outer portion, said outer portion having a circumferential groove and being held in pressed contact with said second support member such that said groove is closed so as to define said restrictor passage;

said thin-walled inner portion including a double-layered structure defined by a first layer formed of a first elastic material, and a second layer formed of a second elastic material which has a larger modulus of elasticity than said first elastic material, to adjust elasticity of said thin-wall inner portion and increase rigidity of said thin-walled inner portion, said first and second layers being in direct axial engagement with each other and elastically deformable together with each other due to a difference between pressures in said pressure-receiving and equilibrium chambers.

4,907,787

RUBBER CARTRIDGE SPRING

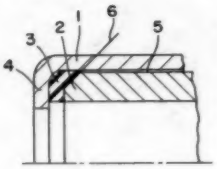
Hans-Werner Schwerdt, Laudenbach, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,886

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735697

Int. Cl.[4] F16F *13/00*

U.S. Cl. 267—140.1 3 Claims



1. A liquid-filled rubber cartridge spring comprising an outer tube (1) and a window tube (2) which are mounted within one another when statically at rest and together define a gap (5), said gap being sealed at both ends by sealing rings (3) made of rubber-elastic material adhesively bonded to one of said window tube and said outer tube, where said sealing rings are disposed on end surfaces (6) of said window tube, the ends of said outer tube are provided with inwardly reaching flanges (4) overreaching said sealing rings, the flanges and sealing rings being compressed resiliently against one another in a sealing manner, said end surfaces and said flanges being at a radially outwardly expanded axial distance from one another, and said end surfaces having an at least partial conical configuration.

4,907,788

DUAL CONCENTRIC CANTED-COIL SPRING APPARATUS

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Continuation-in-part of Ser. No. 186,016, Apr. 25, 1988, and a continuation-in-part of Ser. No. 186,018, Apr. 25, 1988, Pat. No. 4,826,144, and a continuation-in-part of Ser. No. 186,017, Apr. 25, 1988, Pat. No. 4,830,344, and a continuation-in-part of Ser. No. 232,430, Aug. 15, 1988. This application Jan. 30, 1989, Ser. No. 302,976

Int. Cl.[4] F16J *15/24;* F16F *1/06*

U.S. Cl. 267—168 32 Claims

1. Annular coiled spring apparatus comprising:

(a) a first annular spring comprising:

a plurality of coils canted along a centerline thereof;

back angle means for defining the disposition of a trailing portion of each coil with respect to a line normal to the centerline thereof and determining the force-deflection characteristics of the first annular spring;

front angle means for defining the disposition of a leading portion of each coil with respect to the normal line, said front angle means being greater than said back angle means;

said coils being interconnected in a manner forming a garter-type resilient coiled spring;

(b) a second annular spring disposed within said first annular spring comprising:

a plurality of coils canted along a centerline thereof;

back angle means for defining the disposition of a trailing portion of each coil with respect to a line normal to the centerline thereof and determining the force-deflection characteristics of the second annular spring;

front angle means for defining the disposition of a leading portion of each coil with respect to the normal line, said front angle means being greater than said back angle means;

said coils being interconnected in a manner forming a second garter-type resilient coiled spring; and

said centerline of first and second annular spring coinciding and the plurality of coils of the first annular spring canting in an opposite direction along the centerline than the plurality of coils of the second annular spring.

4,907,789

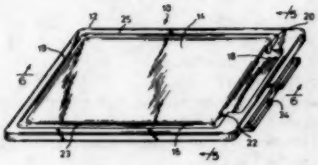
CUTTING BOARD ASSEMBLY

Ralph Tice, 126 Waterford Rd., Island Park, N.Y. 11558

Filed Aug. 24, 1987, Ser. No. 88,807

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 269—13 **8 Claims**



1. A cutting board assembly comprising:

a board member having an upper cutting surface, said cutting surface having a groove around the periphery thereof, said cutting surface including, at one end thereof, an elongated hole therethrough intersecting with said grooves;

a generally L-shaped flange surrounding said elongated slot forming an outwardly extending leg and flange depending from the underside of said board;

a container adapted to fit over the outwardly extending leg of said L-shaped flange; and

means for sealably attaching said container around said outwardly extending leg of said generally L-shaped flange;

said outwardly extending leg of said generally L-shaped flange includes a recess portion to provide for the quick application and removal of attaching seal means and said container from said flange.

4,907,790

PELLET-LIFTING APPARATUS

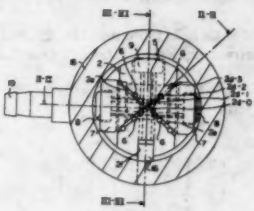
Kazuo Sagiura, Hachioji, and Takashi Takeuchi, Higashiyamato, both of Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,133

Claims priority, application Japan, Dec. 15, 1987, 62-315166

Int. Cl.[4] B25B *11/00*

U.S. Cl. 269—21 **2 Claims**



1. A pellet-lifting apparatus characterized in that said apparatus comprises:

a pin holder which has a plurality of peripheral pin insertion holes formed in an X pattern when viewed from above, said pin holder having V-shaped cut-out areas in the left and right sides surrounded by said X pattern and driven up and down by a vertical driving means;

peripheral lifting pins inserted into said peripheral pin insertion holes; and

V-shaped bridges fastened to said pin holder so that said peripheral lifting pins are pressed against the inside surfaces of cut-out areas in said pin holder.

4,907,791

SIGNATURE FEEDER HAVING IMPROVED SIGNATURE EXTRACTION

George Higgins, Orland Park, and James Wrona, Burbank, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Jul. 29, 1988, Ser. No. 226,221

Int. Cl.[4] B65H *5/02*

U.S. Cl. 271—5 **22 Claims**

1. A machine for feeding signatures, having a first lap and a second lap joined at a backbone, to a delivery station, comprising:

a supply station in which the signatures are to be first loaded in a flat stack with the backbones perpendicular to the direction the signatures will be withdrawn, the supply station including support means for eliminating rolling of the signatures as they depart the supply station, the support means including a pile plate and a riser block mounted on the pile plate, the riser block having a width sufficiently less than the width of the signatures such that the edges of the signatures hang down over the sides of the riser block toward the pile plate, imparting a curvature to the signatures in the stack, the curvature being perpendicular to the direction the signatures will be withdrawn;

a signature stripper means engageable with the foremost

signature of the stack for extracting signatures successively from the stack in the supply station; and

transfer means for receiving signatures from the stripper means and advancing them in a stream to the delivery station.

4,907,792

SHEET GUIDE ADJUSTING APPARATUS

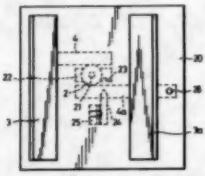
Morimasa Washiashi, and Toshio Koike, both of Tokyo, Japan, assignors to Iwatsu Electric Company, Ltd., Suginamio, Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,967

Claims priority, application Japan, Oct. 23, 1987, 62-161404[U]

Int. Cl.[4] B65H *9/04*

U.S. Cl. 271—240 6 Claims



1. A sheet guide adjusting apparatus comprising:

a machine body; a pair of sliding members supported on said machine body and able to move in a reciprocal manner, said sliding members having guides which are applied respectively to edges of sheets; a drive means mounted on said machine body and able to move in a reciprocal manner between and operatively interconnecting said pair of sliding members; one of said pair of sliding members and said drive means being provided, respectively, with clamping means for clamping said sliding member and said drive means in relation to said machine body.

4,907,793

ARRANGEMENT ALLOWING VARIED USE OF A SURFACE THAT IS PROVIDED WITH A COVERING OF GRASS OR THE LIKE

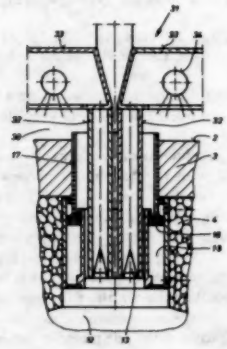
Josef Wund, Ifenstrasse 12, D 7990 Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 331,614

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810818

Int. Cl.[4] E04H *3/10*

U.S. Cl. 272—3 18 Claims



1. An arrangement that allows varied use of a surface that has subsoil and is provided with a covering of grass or the like, said arrangement comprising:

a plurality of base means inserted in said subsoil of said surface, below said grass covering, for the support of a supporting structure that is provided with a floor covering that can be walked or driven upon; when said grass covering itself is to be used, said base means are covered by insert means that are adapted to be placed in said grass covering, and when said surface is to be used for a different purpose, said supporting structure is supported on said base means in such a way as to be spaced from said grass covering, with illuminating means, which produce effects for photo-biological processes, being provided for irradiating said grass covering when said supporting structure is in place.

4,907,794

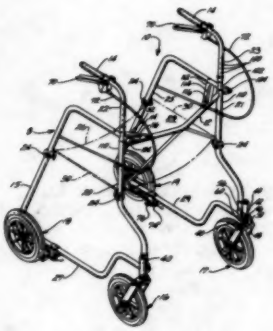
FOLDABLE ROLLING WALKER

Eric P. Rose, Canoga Park, Calif., assignor to Guardian Products, Inc., Arleta, Calif.

Filed Dec. 24, 1987, Ser. No. 137,769

Int. Cl.[4] A61H *3/00*; A47D *13/04*

U.S. Cl. 272—70.3 10 Claims



1. A rolling walker comprising:

(a) a horizontal cross-brace;

(b) side frames pivotally mounted at each end of the horizontal cross-brace, each side frame having a front leg, a rear leg and a horizontal element interconnecting the front and rear legs at the top thereof;

(c) a wheel mounted adjacent the bottom of each rear leg supporting the rear end of the walker;

(d) a wheel mounted at the bottom of each front leg for supporting the front end of the walker, said wheel being offset forward of the pivot axis of each side frame;

(e) a hand support having a free end and a fixed end mounted on and extending upwardly from the horizontal element of each side frame such that a handgrip mounted adjacent the free end of the support is positioned substantially midway between the front and rear wheels for supporting a person so that the person's weight is centered substantially equally between the front and rear wheels;

(f) said front wheels being normally axially pivotable such that the walker may be pushed in different directions; and

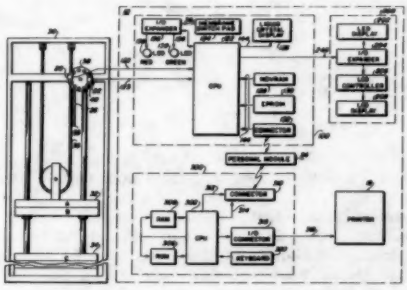
(g) a locking lever operatively associated with each front wheel which is movable between a locked position which maintains each front wheel in an aligned front to rear non-pivoting position and an unlocked position wherein each wheel is freely pivotable about its mounting axis.

4,907,795

COMPUTERIZED EXERCISE MONITORING SYSTEM AND METHOD FOR MONITORING A USER'S EXERCISE PERFORMANCE

Bon F. Shaw, Winter Park, Fla., and Gary M. Bond, Orlando, both of Fla., assignors to Fike Corporation, Blue Springs, Miss.

Continuation of Ser. No. 848,215, Apr. 4, 1986, Pat. No. 4,817,940. This application Feb. 3, 1989, Ser. No. 305,545
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—93 8 Claims



1. A system for monitoring a user's exercise performance on an exercise machine, said system comprising:

monitoring means for monitoring a user's current exercise activity on the exercise machine and for providing monitor signals representative thereof;

memory means for storing data representative of exercise activity different from said current exercise activity on the exercise machine and for producing output signals representative thereof;

evaluating means operably coupled with said monitoring means and said memory means for receiving and evaluating said monitor signals and said output signals respectively and in response thereto for producing display signals representative of an evaluation of said monitor signals and said output signals with respect to one another;

display means for receiving said display signals and, in response thereto, for producing a display representative of said evaluation, said evaluation being thereby representative of said current exercise activity with respect to said different exercise activity;

said memory means further comprising a portable, replaceable memory module detachable from said system; and

means allowing replacement of said module by a different memory module associated with another user.

4,907,796

SKI SIMULATOR

Santiago Roel-Rodriguez, Río Lerma 111, Desp. 2, Col. Miravalle, Monterrey, Nuevo León, Mexico

Continuation-in-part of Ser. No. 65,414, Jun. 22, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 171,957
Int. Cl.[4] A63B *69/18*
U.S. Cl. 272—97 1 Claim

1. An alpine ski simulator comprising:

a frame including adjustment means to adjust the inclination of the frame relative to a horizontal plane;

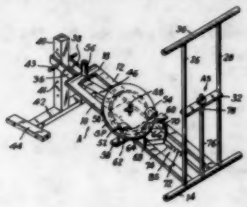
a central shaft connected in a perpendicular, fixed relationship to the frame;

a generally circular platform horizontally mounted on the frame, through the shaft, for rotation and including a ring shaped member mounted underneath said platform;

roller means positioned between said platform and said frame to facilitate rotation;

a fixed band encircling the ring shaped member and attached to the frame for braking purposes, to regulate the rotational speed of said platform;

an inner pair and outer pair of guiding posts vertically attached on the frame, near of the perimeter of the platform, said inner pair of said posts the band against the ring



shaped member of the platform the outer pair of said posts provide tensioning to said band; and,

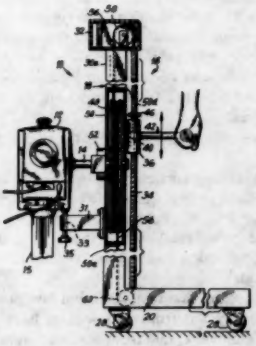
adjustable spring means connected between the band and the frame, to adjust the tension of the band against the ring shaped member, and thus, increase or reduce the speed of rotation.

4,907,797

MUSCLE EXERCISE AND/OR REHABILITATION APPARATUS USING LINEAR MOTION

Walter Gezari, Rocky Point, N.Y., and Daniel Y. Gezari, Chevy Chase, Md., assignors to Biodex Corporation, Shirley, N.Y.

Filed May 25, 1988, Ser. No. 198,568
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—129 24 Claims



1. A muscle exercise and rehabilitation apparatus comprising:

fixture means against which a force can be applied;

sensing means for sensing the force applied to the fixture means and for producing a load signal corresponding thereto;

speed detecting means for producing a velocity signal corresponding to the speed of the fixture means;

servo motor means for producing a rotational output of an output shaft thereof;

closed loop servo means for controlling said motor means in response to said load signal and said velocity signal to control rotation of said output shaft of said servo motor means; and

conversion means for driving said fixture means with a linear motion in opposite directions in response to rotation of said output shaft, said conversion means being connected between said fixture means and said output shaft of said

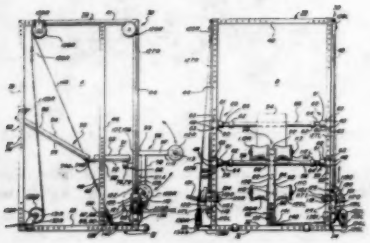
servo motor means for translating said rotational output of said output shaft to linear motion of said fixture means.

4,907,798

MULTI FUNCTION EXERCISE MACHINE

Rory J. Burchatz, 7862 Newman Ave. #B., Huntington Beach, Calif. 92647

Filed Dec. 6, 1988, Ser. No. 280,674
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 12 Claims



1. An exercise machine comprising:

a. A vertically elongated open, box-like structure having a generally rectangular transverse cross-sectional shape and of sufficient height to stand upright within the interior space of said structure, said structure having a horizontally disposed rectangular roof frame, a plurality of vertically disposed columnar members, one each attached to and extending downwards from each corner of said roof frame, said columnar members constituting right and left front vertical frame members and right and left rear vertical frame members, and two intermediate vertical columnar members, one each rearward of and parallel to said right and left front vertical frame members, respectively,

b. at least one reaction force producing means fastened to said structure,

c. at least one pulley mounted near the upper portion of said structure,

d. a cable extending vertically upwards over and around the sheave of said pulley, said cable being fastened at one end to the free end of said reaction force producing means, said cable being graspable at its other end and pullable against the reaction force of said reaction force producing means, and

e. a bench section, said bench section comprising,

(i) a generally flat front seat section having a generally square plan view, said front seat section having attached to its underside an elongated, laterally disposed tubular support member, said tubular support member having at opposite lateral ends means for adjustably fastening at a selected height to an intermediate vertical frame member, and supporting said end of tubular member, thereby supporting said front seat section at a desired height, and

(ii) a generally flat back rest section having a longitudinally elongated, generally rectangular plan view, said back rest section being hingedly joined at its front lateral edge to the rear lateral edge of said front seat section, and said back rest section having attached to its underside an elongated, laterally disposed tubular support member having at opposite lateral ends means for adjustably fastening at a selected height to a rear vertical frame member and supporting said back rest section at a desired height independently of the height of said front seat section.

4,907,799

EXTENSIBLE-RETRACTABLE POOL AND BILLIARD CUE BRIDGESTICK

Michael R. Danner, 4226 2nd Ave. NE., Auburn, Wash. 98105, and H. Jack Danner, P.O. Box 1874, Albirm, Wash. 98071

Filed Jan. 23, 1989, Ser. No. 300,604
Int. Cl.[4] A63D *15/10*
U.S. Cl. 273—23 4 Claims

1. A bridgestick for use in a game involving a ball having a standardized diameter, said bridgestick comprising a bridge and a stick,

said stick having a first end and a second end,

said bridge being attached to said first end and having a perimeter, a plurality of notches set into said perimeter, and elastic means spanning each of said plurality of notches near said perimeter.

4,907,800

BAT SWING PRACTICE APPARATUS

Richard S. Passamaneck, 5150 S. Oak St., Littleton, Colo. 80127, and Larry G. Nelson, 421 Oakmont Cir., Marietta, Ga. 30067

Filed Sep. 24, 1987, Ser. No. 101,248
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 B 16 Claims

1. A device, comprising:

a fan having a plurality of fan blades;

a housing mounting said fan for rotation relative thereto;

an elongated handle attached to said housing to permit a subject to swing said housing such that said fan rotates by relative motion between said fan and ambient to produce a resistance to said swinging and provide exercise to said subject; and

means for adjusting rotational resistance of said fan such that the amount of exercise obtained by swinging said handle can be adjusted.

4,907,801

REBOUND BASEBALL TRAINING APPARATUS

Harold W. Kopp, 137 Daytona Ave., Narragansett, R.I. 02882

Filed Sep. 19, 1988, Ser. No. 245,702
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 R 7 Claims

1. Apparatus for training a player in baseball, said apparatus comprising:

(a) stationary base structure adapted to rest upon a substantially horizontal surface;

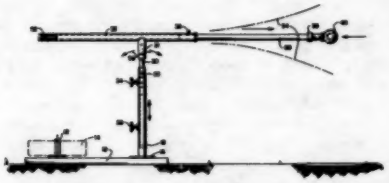
(b) a first support member vertically and fixedly mounted upon said base structure;.

(c) a second support member telescopingly engaged, within said first support member for freely sliding, reciprocal movement with respect thereto;

(d) means for releasably fixing said second support member at a predetermined height and rotational orientation with respect to said first support member;

(e) an elongated, hollow tube perpendicularly and fixedly mounted upon the upper end of said second support member, said tube having an open end and a closed end;

(f) an elongated rod having an inner end telescopingly engaged within said hollow tube open end for freely sliding, reciprocal motion between first and second positions;



(g) a baseball fixedly attached to the outer end of said rod for application of a propelling force by a player, thereby moving said rod from said first to said second position thereof; and

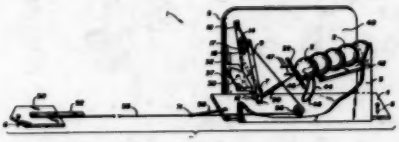
(h) resilient return means constructed and arranged to absorb kinetic energy from movement of said rod to said second position and to return a portion of said energy to return said rod toward said first position.

4,907,802

BALL THROWING APPARATUS

Walter L. Gatin, R.R.1, S12, C64, Chase, B.C., Canada VOE 1MO

Filed May 16, 1989, Ser. No. 352,438
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 R 22 Claims



1. A ball throwing apparatus comprising:

a base;

a throwing arm mounted on said base for pivotal movement between a ball loading position and a released position;

ball receiving means for holding a ball to be thrown mounted on said throwing arm;

a suction cup element positioned to be contacted and depressed by said throwing arm to releasably hold said throwing arm in said ball loading position;

leaking means for releasing the hold of said suction cup element;

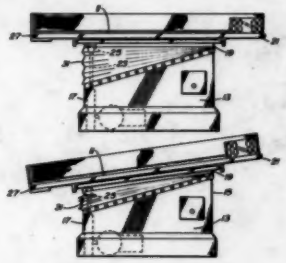
actuating means attached to said throwing arm for moving said arm from said ball loading position to said released position upon release of said throwing arm by said suction cup element, the movement of said throwing arm between said positions resulting in a throwing motion.

4,907,803

GAMEBOARD ACTIVATION/DEACTIVATION SYSTEM

William C. Van Anda, 2050 Allen St., Reno, Nev. 89509

Filed Apr. 10, 1989, Ser. No. 335,955
Int. Cl.[4] A63B *67/18*
U.S. Cl. 273—30 6 Claims



1. A gameboard activation/deactivation system comprising

a gameboard surface that needs to be level during play,

a mounting base for said gameboard provided with a high side and a lower side in relation to said high side, said gameboard being hinged to the high side of said mounting base, and

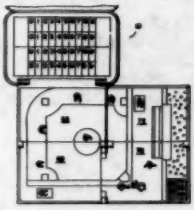
means disposed in said base for raising said gameboard to level and lowering said gameboard to a tilted position in response to activation and deactivation signals, respectively.

4,907,804

POCKET SIZED TOY GAME

Abraham Arad, Westport, Conn., and Melvin Kennedy, Hampton Bays, N.Y., assignors to Tiger Electronics, Inc., Vernon Hills, Ill.

Filed Jan. 23, 1989, Ser. No. 300,272
Int. Cl.[4] A63F *7/06*
U.S. Cl. 273—93 R 14 Claims



7. A pocket sized toy game comprising:

a walled enclosure including a cover pivotally interconnected to a base to define a cavity therebetween when said cover is in a closed position and lies substantially parallel to said base, one of said cover and said base housing a chamber bounded on at least one side by a transparent wall with at least one die movably retained in said chamber;

a game board pivotally connected to one of said cover and said base and removably accommodated within said cavity; and

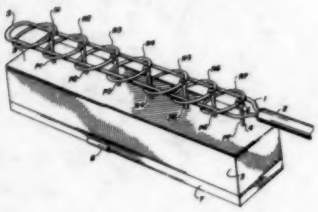
manually operated means arranged adjacent said chamber for impacting against and thereby randomly moving said die within said chamber for facilitating playing the game.

4,907,805

RING PUZZLE GAME

Derrall W. Watkins, and Douglas W. Watkins, both of 5838 N. Main St., Jacksonville, Fla. 32208

Filed Jan. 29, 1987, Ser. No. 8,476
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—158 3 Claims



1. An improved ring puzzle game comprising:

a plurality of rings, variable in number, each ring held in place by being permanently enclosed within a closed loop at the top of a post and each ring overlapping each adjacent ring and post;

a plurality of posts, one for each ring, each having a closed loop at the top to encircle each ring, each post being inserted through a hole in the top of a box-like enclosure, said posts having removable means for securing said posts in place;

a wand-like elongated closed loop member having a handle at one end, said loop member being insertable and removable from an interlocking position with the rings and posts by a series of prescribed manipulations of the rings, posts and loop member; and

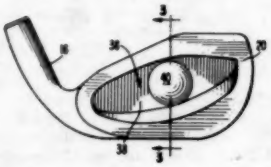
a box-like enclosure having a plurality of aligned holes through the top thereof to hold the rings and cover the bottom of the posts, said box-like enclosure having a bottom cover which can be opened to store components of the game.

4,907,806

PERIMETER WEIGHTED IRON TYPE GOLF CLUB HEAD WITH UPPER ALIGNMENT AND SIGHTING AREA AND CENTRALLY LOCATED COMPLEMENTARY WEIGHT

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Oct. 25, 1988, Ser. No. 261,892
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—164 6 Claims



1. An iron type golf club head having an improved weight distribution and sighting and alignment means comprising:

a main body including a heel, hosel proximate said heel, a toe, a sole, a back, a ball striking face to hit the ball along an intended line of flight, a center of percussion on said ball striking face, a complementary rear face, and a top ridge extending from the hosel to the toe;

sighting and alignment means formed on only a portion of said top ridge of said golf club head, said sighting and alignment means including a straight section on said top ridge extending in a direction from heel to toe perpendicular to the intended line of flight from a first point adjacent said toe to a second point located between said toe and said hosel and spaced substantially from said hosel;

a peripheral mass formed on at least the heel, toe and lower surface portions of the outer periphery of said rear face of the club head;

said peripheral mass defining a cavity located on said rear face of the club head and providing a perimeter weighting for the club head; said cavity having side walls extending outwardly from said complementary rear face; and

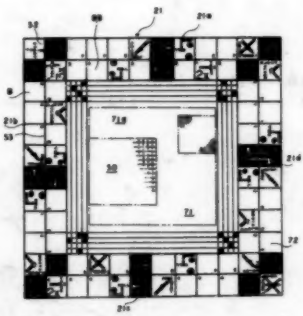
a centrally located, rounded, concentrated weight member formed completely within said cavity and spaced from said cavity side walls and located on said complementary rear face at said center of percussion; said weight member being further characterized by a raised surface extending rearwardly from said rear face to substantially in alignment with the rearmos said peripheral mass and in the same direction as said side walls of said peripheral mass, the extremities of said weight member being spaced radially about said center of percussion.

4,907,807

BOARD GAME FOR PLAYING CROSSWORD PUZZLES

Donald V. Lee, and Julius C. Ermis, both of 1718 P Street, N.W. - #402, Washington, D.C. 20036

Filed Jan. 11, 1989, Ser. No. 295,539
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—240 15 Claims



1. A game apparatus comprising:

a playing board including a first continuous playing path of contiguous squares adjacent the outer edges of said board, a second continuous playing path of contiguous squares adjacent said path, groups of said squares having indicia which relate to subsequent play;

a plurality of playing pieces for delineating individual players;

chance means for determining the movement of said playing pieces in turn a number of spaces along said paths;

a plurality of play cards having indicia thereon relating to word clues for ascertaining single words and said words indicated by said clues;

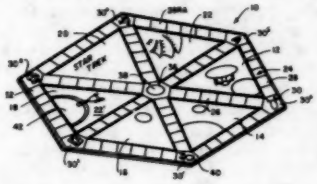
a crossword puzzle of a conventional type for association with said playing board for play by a respective player upon the player successfully ascertaining said single words and chance means for indicating crossword puzzle play.

4,907,808

TRIVIA BOARD GAME

Glenn Turner, and Danny Walters, both of 415 Charlotte Ave., Rocky Mount, N.C. 27804

Filed Nov. 14. 1988, Ser. No. 270,946
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—240 **1 Claim**



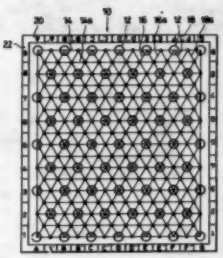
1. A method of playing a game comprising:
(A) providing a game which comprises
(1) a hexagonal game board which includes
(i) a plurality of areas divided by game piece landing areas with special landing areas having special instructions, and destination areas which include areas associated with various aspects of STAR TREK adventures, said various aspects including aspects associated with the television series, star fleet regulations, STAR TREK movies, aliens associated with STAR TREK, fleet personnel, technical information associated with STAR TREK, and
(ii) a central area,
(2) a plurality of instruction cards associated with the special landing areas priding special instructions for the continuation of play,
(3) a plurality of question and answer cards having trivia questions thereon which must be answered by a player taking a turn for that player to continue play on any one turn, said trivia questions being based on adventures of STAR TREK,
(4) a plurality of special question and answer cards having special questions thereon that must be answered before a player landing on a special landing area is permitted to obtain special positions on the game board;
(5) dice for controlling the number of landing areas which can be advanced for a turn,
(6) a knockdown model having a plurality of part, with each part being obtained by the player taking a turn when that player achieves a certain goal, said model simulating ENTERPRISE used in STAR TREK and including a game piece that doubles a base of the model, a fuselage, engine portions, aa main ship portion and a support rod,
(7) a game book containing rules and further criteria for play;
(B) rolling said dice to determine a starting player;
(C) having said starting player select a destination area toward which he wishes to advance;
(D) having said starting player roll the dice to determine how many landing areas to advance towards said destination area, and having said starting player advance a number of landing areas associated with a number appearing on said dice;
(E) having one opponent ask said starting player a trivia question based on STAR TREK;
(F) requiring said starting player to answer said trivia question;
(G) permitting said starting player to continue and to roll the dice again if the answer is correct, and causing said starting player to cease his turn if said answer is incorrect;
(H) having an opponent ask the player taking a turn a further question when that player taking a turn lands on a selected destination area;
(I) awarding the player taking a turn a model portion of said model when that player taking a turn answers said special question correctly, and causing said player taking a turn to cease his turn when the special question is answered incorrectly;
(J) having special questions asked of any player taking a turn who lands on specially selected landing and destination areas, and determining continued play of such player landing on said selected areas depending on the answer given to such selected questions, said continued play including steps of having an opponent ask a special question from a special list and requiring said player to draw a penalty card if the answer to the special question is incorrect and to follow instructions on said penalty card and permitting said player to continue play if the answer is correct,
(K) providing a category card check list for each player with each category card including a special area for each of a plurality of categories;
(L) checking off an appropriate special area upon receiving a model portion;
(M) obtaining model parts according to a specified order;
(O) requiring special actions from any player landing on a predetermined landing area;
(P) determining a winner when one player accumulates all of the parts of said model and advances to a predetermined winning landing area;
(Q) requiring any player to correctly answer a question from a special list of questions before advancing to said predetermined winning landing area;
(R) requiring any player taking a turn to return to start upon landing on a selected penalty landing area;
(S) requiring any player taking a turn to lose a turn upon landing on a selected loss of turn landing area;
(T) placing a time limit on the answering of a question; and
(U) selecting questions to be asked of a player taking a turn according to the destination area selected by such player taking a turn.

4,907,809

GAME KIT UTILIZING BOARD AND PIECES

Akihiro Nakayama, and Tomoko Tachiki, both of Tokyo, Japan, assignors to Takio Kurokawa, Tokyo, Japan

Filed Jun. 7, 1988, Ser. No. 203,736
Int. Cl.[4] A63F *3/02, 3/00*
U.S. Cl. 273—242 **5 Claims**



1. Game kit comprising a game board with crosses thereon corresponding to respective intersecting points of line segments and a plurality of pieces to be set up on said crosses; said crosses corresponding to the intersecting points of three gruops of line segments, each group of line segments extending in parallel to one another and intersecting at an angle of 60° with the other two groups of line segments, and all the line segments of said groups extending at uniform intervals; said crosses corresponding to apices of equilateral triangular grids formed by said three groups of line segments; auxiliary line segments lying midway between and parallel to respective pairs of adjacent line segments forming additional intersecting

points of auxiliary line segments; said crosses of the line segments and the additional intersecting points of said auxiliary line segments being visually distinguishable from one another; and each of said pieces being adapted to be used on the game board selectively with its face or back directed upwards and provided with markings to identify said face and back.

4,907,810

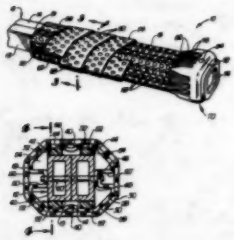
RACQUET HANDLE

Carlton L. Whiteford, 3 High Point Rd., Westport, Conn. 06880

Continuation of Ser. No. 842,288, Mar. 21, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 251,981

Int. Cl.[4] A63B *49/08*

U.S. Cl. 273—73 J **14 Claims**



1. A racquet handle assembly for grasping by a player's hand, comprising:

a shank;

a tubular member, said shank and said tubular member cooperating to define an annular passageway, said tubular member having a first plurality of apertures therethrough,

means for pivotally mounting said tubular member upon said shank;

shock absorbing strips tightly engaged between said shank and said tubular member; and

moisture removal means mounted on said tubular member, said moisture removal means having a second plurality of apertures therethrough, said first and said second plurality of apertures cooperating to communicate said annular passageway and said moisture removal means and to provide a mixture of registered and unregistered apertures, such that air may flow through said annular cavity to impinge upon said moisture removal means and said player's hand to increase the evaporation of perspiration therefrom.

4,907,811

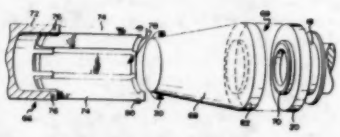
STRETCHABLE OIL SEAL AND METHOD OF INSTALLATION

Stephen E. Nash, Lakeland, and Gerald P. Pichler, Dearborn, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 149,466, Jan. 28, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,208

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—9 **8 Claims**



1. In combination, a stretchable shaft seal stretched over a crankshaft and sealing fluid between said crankshaft and a split housing, said crankshaft having a predetermined diameter and comprising a flange having a diameter substantially greater than said predetermined diameter, said housing comprising a first housing member and a second housing member, said first and second housing members defining a split bore therebetween and clamping said soil therein;

said seal comprising an elastomeric seal body having a continuous annular form and providing with an integrally molded seal lip, said seal body and said seal lip each comprising an elastomeric material which accommodates elongation over said flanged crankshaft of at least 100% of its original non-stretched length and recovers to its originally molded dimension and forms a continuous positive elastic seal around said flanged crankshaft after undergoing said elongation and wherein leak paths through said seal body are eliminated by said continuous annular form;

said seal body having an external circumferential outer surface portion compressed within said split bore and forming a continuous non-rotating annular static seal against said split bore; and

said seal lip projecting from said seal body and forming said positive elastic seal as a continuous dynamic elastic seal around seal predetermined diameter of said crankshaft after being stretched over said flange.

4,907,812

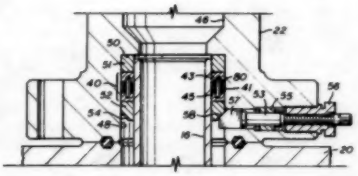
BI-DIRECTIONAL UNSUPPORTED AREA SEAL

Danny S. Meyer, Richmond, Tex., assignor to Cooper Industries Inc., Houston, Tex.

Filed Oct. 6, 1986, Ser. No. 915,589

Int. Cl.[4] F16J *15/20*

U.S. Cl. 277—117 **4 Claims**



1. A packing assembly for sealing an annulus between spaced inner and outer cylindrical surfaces arranged in concentric coaxial relationship with the outer cylindrical surface having an inwardly extending annular shoulder, the packing assembly being positioned within the annulus and comprising:

a plurality of packing rings in said annular space arranged in contiguous stacked relation with one another and disposed about the inner cylindrical surface in contact therewith for effecting a seal between said spaced inner and outer cylindrical surfaces:

a pair of retainer rings between which said packing rings are located, each retainer ring being disposed in sleeved relation about said inner cylindrical surface, with one said retainer ring being restrained in one direction of axial movement by said annular shoulder and each retainer ring has an annular end surface remote from said packing rings upon which fluid pressure in the annulus is adapted to act in an axial direction to urge the retainer rings towards one another and thereby compress and squeeze the packing rings against said inner and outer cylindrical surfaces to increase the sealing effect of the packing rings and wherein the surface of each retainer ring at the ends of the packing assembly exceeds the surface area of the adjacent packing ring contacting therewith whereby the force per unit area transmitted by a retainer ring to the packing rings upon application of fluid pressure from either axial direction is amplified to increase the sealing effect of the

packing rings as the fluid pressure acting on the sealing assembly increases.

4,907,813

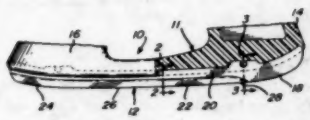
ICE HOCKEY SKATE BLADE

Kenneth Hall, Pointe Claire, Quebec, Canada, assignor to Canstar Sports Group Inc., Montreal, Quebec, Canada

Filed Sep. 27, 1988, Ser. No. 249,491

Int. Cl.[4] A63C *1/32*

U.S. Cl. 280—11.18 **2 Claims**



1. An ice hockey skate blade of suitable metal comprising an elongated member with an upper portion and a lower portion, the lower portion including the skating edge, the blade including a toe section, a median section, and a heel section in the longitudinal extent of the blade, characterized by the blade having, in the upper portion and toe section, planar parallel side surfaces and having a width in the range of 2.7 to 3 mm. while the lower portion of the blade, in the median section and heel section, has planar parallel side surfaces having a width in the range of 1.4 to 2 mm., the side surfaces of the toe section merging with side surfaces of the upper portion of the median section at the interface thereof by curved concave surfaces extending from the lower toe to the upper median sections, and the interface is in the area of the ball of the foot.

4,907,814

SELF-ADJUSTING BEARING

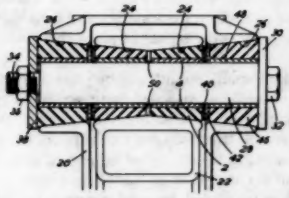
Peter M. Foster, Darlington, England, assignor to George Blair Public Limited Company, Great Britain

Filed Feb. 23, 1989, Ser. No. 314,553

Claims priority, application United Kingdom, Mar. 3, 1988, 8805124

Int. Cl.[4] B60G *5/00*

U.S. Cl. 280—104 **4 Claims**



1. A self-adjusting bearing comprising an elongate body portion of compressible, resilient material and of substantially annular shape in transverse section, having inner and outer surfaces thereto, and a liner of wear-resistant material secured to, substantially to envelop, said inner surface of the body portion, the elongate body portion being of truncated conical shape and defining a cylindrical bore centrally therethrough in which the liner is secured to react on a component received within said bore to undergo rotation relative to the bearing, the liner including a plurality of independent segments each of arcuate transverse section and having side edges thereto, the side edges of adjacent segments being spaced from one another, and the segments having surfaces remote from the body portion which define the bearing surface of the bearing, the arrangement being such that, on location of the bearing in an associated, correspondingly-tapered bore whereby the body portion is radially compressed, radial forces are established within the body portion which urge the segments of the liner into bearing contact with said component.

4,907,815

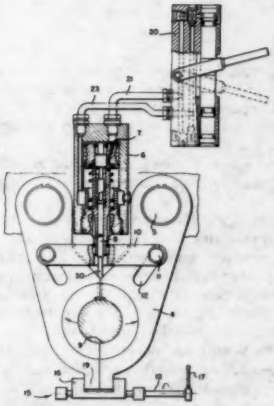
FIFTH WHEEL COUPLING

Walter Hunger, Otto-Nagler-Strasse 13, 8700 Wuerzburg, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,147

Int. Cl.[4] B62D *53/10, 53/12*

U.S. Cl. 280—435 **19 Claims**



1. A fifth wheel coupling for connecting a semitrailer to a towing vehicle, comprising:

two swivel-articulated closing jaws having semicircular clearances for grasping a king pin on the semitrailer;

means for swiveling the jaws between open and closed positions, comprising:

a hydraulic cylinder comprising an actuating piston displaceably seated in the hydraulic cylinder and having a piston head defining with the cylinder a piston head space, an actuating piston rod defining with the cylinder a piston rod space, and a channel connecting the piston head space and piston rod space, the piston movable between an outward position in which the jaws are opened and an inward position in which the jaws are closed;

means for biasing the actuating piston in the inward position;

a spool valve seated in one end of a central bore in the actuating piston rod and movable between a first position in which the channel is closed and a second position in which the channel is open;

a tappet seated in the other end of the central bore in the actuating piston rod and protruding into the semicircular clearances so as to be engagable with the king pin, the tappet being movable between a first position in which the tappet actuates the spool valve to its second position channel tappet allows the spool valve to move to its first position closed; and

means for biasing the tappet in the outward position.

4,907,816

APPARATUS FOR ATTACHING ONE END OF A SKI BOOT HAVING AN ATTACHING ELEMENT TO A SKI

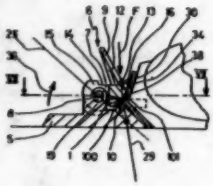
Josiane Dunand, Cran Gevrier; Paul Arnulf, Alby S/Cheran, and Denis Gasquet, Annecy, all of France, assignors to Salomon S.A., Annecy Cedex, France

Continuation of Ser. No. 829,185, Feb. 14, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,669

Claims priority, application European Pat. Off., Mar. 5, 1985, 85400412.2

Int. Cl.[4] A63C 9/20

U.S. Cl. 280—615 **56 Claims**



1. An apparatus for connecting one end of a boot to a ski, wherein said end of said boot has an attaching element, and wherein said apparatus comprises:

(a) a support element for engaging said attaching element of said boot;

(b) a support adapted to be positioned on an upper surface of said ski, said support element projecting from said support;

(c) a movable lock for cooperation with said support element and said attaching element for locking said boot to said ski, wherein said movable lock is adapted to pivot with respect to said ski between an inactive, non-retention position in which said boot is free to be connected to and removed from said ski, and an active, retention position in which said boot is locked on said ski;

(d) means for biasing said movable lock against displacement out of said active, retention position; and

(e) means for pivotally connecting said movable lock on said support so as to permit said movable lock to be pivotally supported by a portion of said support in said inactive, non-retention position and during movement toward and away from said active, retention position, and for permitting said movable lock to be unsupported by said portion of said support in said active, retention position, wherein said means for pivotally connecting pivots about an axis and is spaced from said support in all directions about said axis in said active, retention position.

4,907,817

BINDING FOR CROSS-COUNTRY SKI

Gunter Schwarz, Au, Switzerland, assignor to Salomon S.A., Annecy Cedex, France

PCT No. PCT/CH87/00046, § 371 Date Dec. 15, 1987, § 102(e) Date Dec. 15, 1987, PCT Pub. No. WO87/06486, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 21, 1987, Ser. No. 143,851

Claims priority, application Switzerland, Apr. 30, 1986, 1765/86; Nov. 4, 1986, 4371/86; Nov. 5, 1986, 4406/86

Int. Cl.[4] A63C 9/20

U.S. Cl. 280—615 **28 Claims**

1. A ski binding for cross-country skis, said binding comprising:

a first binding unit that is permanently attached to the ski;

a second binding unit that forms a part of a ski shoe;

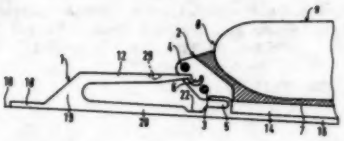
two parallel shafts;

a fixed shaft receiver associated with one said shaft;

a second shaft receiver associated with the other said shaft;

at least one spring element;

said fixed shaft receiver holding it's associated shaft in a direction perpendicular to a major axis of the ski, the two shafts and their associated shaft receivers both connecting the binding units to each other and spaced from each other



in the longitudinal direction of the ski and at least one of the shafts being loaded by said at least one spring element in a direction at least approximately perpendicular to the ski when the ski shoe is set on the ski.

4,907,818

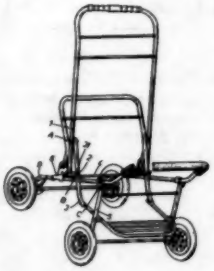
SAFETY DEVICE TO PREVENT BABY CARRIAGES FROM BEING ACCIDENTALLY FOLDED

Mong H. Chai, No. 41, Sec. 1, Chin Sha ST., Tainan, Taiwan, R.O.C., Taiwan

Continuation of Ser. No. 91,127, Aug. 31, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 326,446

Int. Cl.[4] B62B 7/08

U.S. Cl. 280—642 **1 Claim**



1. A foldable baby carriage provided with a safety device to prevent accidental folding thereof, comprising:

a U-shaped handle bar;

a pair of front supports having front wheels mounted at one end thereof;

a pair of rear supports having rear wheels mounted at one end respectively and the end opposite being pivotally connected to the said front supports at ends thereof opposite the wheels and adapted to pivot thereabout in a first direction;

a stop block pivotally mounted at one end thereof on one of said rear supports, disposed with an end opposite the pivotally mounted end normally disposed in an extended position spaced from said one rear support and adjacent to and extending transversely of an end of said handle bar when said carriage is in an upright position;

first bias means carried by said carriage for urging said opposite end of the stop block into its extended position adjacent a lower end of said handle bar;

a pair of linking rods, each pivotally connected at one end to opposite legs of said handle bar and each pivotally connected to each of said rear supports, adapted to pivot in a second direction opposite the first direction the connections being disposed between said stop block and the ends of said rear supports pivotally connected to said front

supports, with one of said rods having a stud disposed adjacent said stop block; and

a latch member pivotally mounted at a lower end of said handle bar, said member normally engaging the stud; and

second bias means carried by said carriage for normally urging said latch into engagement with said stud,

whereby, to fold said carriage, it is necessary to both disengage said latch member and depress said stop block against the urging of said first bias means towards said rear support and away from said handle bar end so that the carriage can be folded by rotating said handle bar about its connection to said link rods and said front and rear supports about their pivotal connection in the first direction and moving said link rods about their pivotal connection to said rear supports in an opposite second direction.

4,907,819

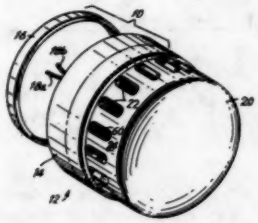
LIGHTWEIGHT NON-WELDED GAS GENERATOR WITH ROLLED SPUN LIP

Jess Cuevas, Scottsdale, Ariz., assignor to Talley Automotive Products, Inc., Mesa, Ariz.

Filed Sep. 16, 1988, Ser. No. 246,065

Int. Cl.[4] B60R *21/16, 21/26*

U.S. Cl. 280—736 **37 Claims**



35. A lightweight non-welded pyrotechnic gas-generating inflator apparatus which comprises:

(a) a domed diffuser member having a first open end and a second closed end, said diffuser member comprising a plurality of diffuser ports spaced equidistantly around the lateral periphery thereof, said ports providing fluid communication between a combustion cavity defined within said inflator and an interior portion of an automobile air bag operatively associated with said inflator so as to permit the deployment of said air bag upon combustion of a pyrotechnic gas generant material stored within said inflator;

(b) a closure plate member sealing the open end of said diffuser member, thus forming an inflator housing;

wherein said open end of said diffuser member is rolled over an outer peripheral edge portion of said closure plate member at an angle of about 180° to a remaining lateral wall portion of said diffuser member toward a bottom surface of said closure plate member to form a rolled lip thereover, said rolled lip creating a structural seal between said diffuser member and said closure member, both said diffuser member and said closure plate member formed of a relatively lightweight, corrosion-resistant, high tensile strength material

(c) a sufficient amount of a combustible gas generant material discreetly packaged within the combustion cavity to produce, upon ignition thereof, a volume of a gaseous product sufficient to substantially inflate said automobile air bag within about 30–60 milliseconds;

(d) an electrically actuated squib adhesively secured within said housing, said squib operatively associated with at least one remote impact sensor capable of determining the occurrence of a primary collision between an automobile in which it is installed and another object and producing a signal as a result thereof which acts to initiate combustion of said gas generant material;

(e) a filter assembly within said inflator housing, said assembly interposed between said gas generant material and said diffuser ports to permit filtering and cooling of said gaseous combustion products prior to the entry thereof into said automobile air bag, said filter assembly comprising

(1) first and second ring-shaped members configured to form annular filter frame means, at least one of said ring-shaped members having at least one tab member formed integrally thereupon and extending outwardly therefrom toward said other ring-shaped member to maintain a predetermined spacing between said ring-shaped members upon the formation of said frame means; and

(2) a plurality of filtration layers supported upon said filter frame means, each said filtration layer positioned so as to at least partially overlap a preceding underlying one of said filtration layers around an entire outer annular surface of said filter frame means,

an entire upper and lower circumferential edge portion of both said first and said second ring-shaped members being adapted for obtaining a circular line contact with an inner portion of said inflator housing, thus causing said filter assembly to be self-sealing against said inner housing portion as a result of outwardly directed hoop stresses produced thereupon by activation of said inflator, such that a gaseous combustion product produced thereby is prevented from bypassing said filter assembly and is therefore directed through said filtration means in a serpentine path so as to cool and filter said gas, and

(f) a ring-shaped member configured and adapted for snap-locking engagement with a terminal portion of said rolled lip against said bottom surface of said closure member, said locking member further comprising a notched edge portion along an outer surface thereof configured to engage at least an outer terminal end of said lip

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4,907,820

BELT RETRACTOR

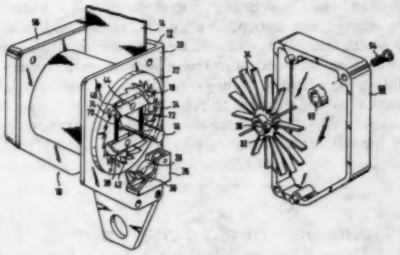
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 329,940

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810656

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—806 **21 Claims**



1. A belt retractor for a motor vehicle safety belt restraining system comprising a housing, a belt coiling shaft rotatably mounted in said housing and a vehicle-sensitive and webbing-sensitive locking mechanism, said locking mechanism having a ratchet toothing member fixed to said housing and a pair of locking pawls pivotably and eccentrically mounted on a side face of said belt coiling shaft and which are biased by a return spring into a rest position out of engagement with the teeth of said ratched toothing member and are mounted for pivotal vehicle-sensitive movement into locking engagement with the

teeth of said ratchet toothing member under the action of a cam member which is rotatable relatively to said belt coiling shaft and is provided at its outer periphery with control teeth which cooperate with a control pawl drivable by a vehicle-sensitive sensor, each of said locking pawls being mounted in its center of gravity and the webbing-sensitive locking taking place solely under the action of inertia forces occurring upon sudden acceleration of said belt coiling shaft, and said locking pawls having engagement faces which are offset with respect to each other in the peripheral direction of said belt coiling shaft by an angle which corresponds to a fraction of the pitch of the teeth of said ratchet toothing member.

4,907,821

DEVICE FOR HEIGHT ADJUSTMENT OF AN ANCHORING FITTING FOR A SAFETY BELT

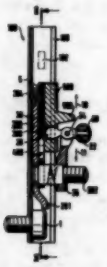
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 331,257

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813527

Int. Cl.[4] B60R *22/20, 22/46*

U.S. Cl. 280—808 **6 Claims**



1. Device for height adjustment of an anchoring fitting in a safety belt system for motor vehicles comprising a guide rail to be secured to the vehicle and provided with a plurality of detent elements at different heights, a loadbearing fitting member which is displaceable in said guide rail, a detent means for releasable locking of said fitting member at a selected one of said detent elements of the guide rail and an actuating element mounted on said loadbearing fitting member for releasing locking engagement between said detent means and said selected detent element by performing a movement in the same direction as an intended adjustment movement relatively to said fitting member, a compensation mass being associated with said actuating element to provide an inertial force communicated to said actuating member with an orientation opposite to inertial forces generated by inertia of said actuating element upon movement of said loadbearing fitting member.

4,907,822

ROUNDING OF HARD COVER BOOKS

David G. Carter, Chorleywood; Derek J. Green, Langley, and Anthony J. Clark, Thame, all of England, assignors to National Starch and Chemical Corp., Bridgewater, N.J.

Filed Sep. 26, 1988, Ser. No. 249,490

Int. Cl.[4] B42D *1/00;* **B42B** *9/06;* **B42L** *5/02*

U.S. Cl. 281—15.1 **19 Claims**

1. A rounded hard cover book comprising a cased-in bookblock composed of a collected seris of signatures enclosed by means of end papers, the edges of which are coated with a solvent-free hot melt polyurethane adhesive composition which is solid at room temperature consisting essentially of:

(a) 5 to 90% by weight of a urethane prepolymer having an isocyanate content of 0.25 to 15% and an isocyanate index greater than 1 and no more than about 2;

(b) 10 to 95% by weight of a low molecular weight polymer of ethylenically unsaturated monomers containing no active hydrogen; said hot melt adhesive formulation being characterized, in the absence of tackifiers and/or plasticizers, by a viscosity of 3000 to 50,000 cps. at 120° C.

4,907,823

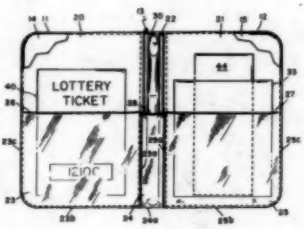
LOTTERY KIT

Denise M. Windish, 376 LaBore Rd., No. 109, Little Canada, Minn. 55117

Filed Jan. 17, 1989, Ser. No. 298,059

Int. Cl.[4] B42D *3/00*

U.S. Cl. 281—31 **9 Claims**



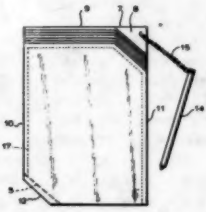
1. A pocket lottery kit for holding a lottery ticket with removable particle covering material thereon and removable particles scraped from a lottery ticket comprising:

a first panel of heat sealable material having peripheral edges and a second panel of heat sealable material, said first panel having a first inside sheet of heat sealable material having peripheral edges with the peripheral edges of said first inside sheet heat sealed to said first panel along the peripheral edges of said first panel to provide a pocket for receiving a lottery ticket, said second panel having peripheral edges and a second inside sheet of heat sealable material having peripheral edges with said second inside sheet heat sealed to said peripheral edges of said second panel to provide a pocket for a collection mat;

a flexible hinge connecting said first panel to said second panel, said flexible hinge including a pocket for frictionally holding a scraping tool;

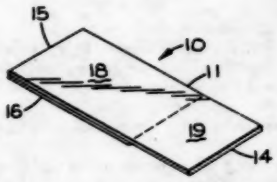
a collection mat of a foldable flexible polymer plastic material for placing a lottery ticket on when the user scrapes removable particles off the lottery ticket, said foldable polymer plastic made from a material to produce a clinging action for removable particles removed from the lottery ticket to eliminate the soiling mess of particles adhering to a person or a persons clothing; and a scrapping tool for removing particle covering material from a lottery ticket by scraping the lottery tool over the removable particles, said scraping tool having a scraping blade with a straight edge to permit a user to scrape removable particles from a lottery ticket onto said foldable polymer plastic material so that when the user has scraped the removable particles onto said collection mat the user can fold and place said collection mat with the removed particles clinging to said collection mat in the pocket lottery kit thereby preventing the removable particles from falling into the user's pocket as the pocket lottery kit is carried about.

4,907,824
DEVICE FOR WRITING
Yakov Smirnoff, 1427 N. Kings Rd., Los Angeles, Calif. 90069
Filed Sep. 19, 1988, Ser. No. 245,526
Int. Cl.[4] B42D *17/00*
U.S. Cl. 281—45 11 Claims



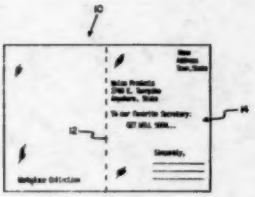
1. A device for writing in a shower comprising
a substantially flat support having a rear surface arranged to be attached to a substantially vertical wall so as to hold said support in a substantially vertical position, said support also having a front surface;
a carrier to be written on, said carrier being attached to said front surface of said support and including a plurality of sheets in form of a stack such that each of said sheets can be written on and successively removed from said stack after writing, said sheets of said stack being composed of a water-resistant material which does not deteriorate under the action of water and permits writing on said sheets, said stack having upper, lower and two lateral sides when said stack is attached to said support and said support is in said substantially vertical position, said sheets of said stack being connected with one another along said upper side and said two lateral sides so as to prevent penetration of water between said sheets from said upper side and said two lateral sides and at the same time permit gripping of each of said sheets by a user from said lower side; and
writing means attached to said support and operative for writing on each of said sheets of said stack successively after one another.

4,907,825
SHEET AND DISPENSER PACKAGE THEREFOR
Alden R. Miles; Theodore F. Schwandt; James C. Nygard; Harry A. Loder, and John J. Emmel, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Division of Ser. No. 57,625, Jun. 3, 1987, Pat. No. 4,770,320.
This application Sep. 8, 1988, Ser. No. 241,962
Int. Cl.[4] B42D *15/00*
U.S. Cl. 281—51 12 Claims



1. A sheet for the temporary marking of portions of documents comprising an elongate layer of flexible polymeric material having opposite major side surfaces and first and second opposite ends, and having a coating of repositionable pressure sensitive adhesive on a second end portion of one of said side surfaces adjacent said second end while being free of adhesive on both of said side surfaces along a first end portion thereof adjacent said first end, both of said end portions being adapted to be written on, said first end portion being visually distinctive, and said adhesive coated second end portion being generally transparent when adhered to a substrate.

4,907,826
BUSINESS ORIENTED GREETING CARDS
Corinne Versage, 3 Rosbury La., Bridgeport, Conn. 06606
Filed Sep. 11, 1986, Ser. No. 906,090
Int. Cl.[4] H09F *1/04, 1/00*; B42D *15/00, 15/04*
U.S. Cl. 283—56 2 Claims

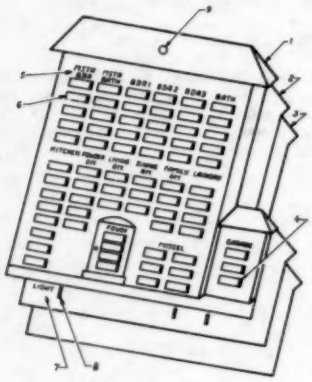


1. As an article of manufacture, a greeting card comprising a piece of card stock and a unitary message imprinted thereon, said message being a pun uniquely appropriate for being conveyed by a sending entity to a person who is related to the sending entity in a professional or business way, wherein said piece of card stock has a fold line providing said card with a plurality of pages, said message being partly on one of said pages and partly on another of said pages and wherein said message is visible in part but not in its entirety when said card is folded on said fold line, and wherein the part of said message which reveals said pun is visible only when said card is unfolded on said fold line and is completely invisible when said card is folded on said fold line.

4,907,827
SELF-ORGANIZER
Leon Khazin, 425 Selma St., Philadelphia, Pa. 19116, and Leonard Kravets, 19 Addington Dr., Feasterville, Pa. 19047
Filed Jun. 3, 1988, Ser. No. 169,594
Int. Cl.[4] B42D *15/00*; G09F *1/00*; G09D *3/00*
U.S. Cl. 283—65 9 Claims

1. A device for reminding a subject to take care of a plurality of objects, comprising
a front panel, a middle panel and a back panel which are superposed over one another,
said middle panel having a plurality of names of objects to take care of, arranged at predetermined locations,
said front panel having a plurality of windows provided at locations which correspond to said locations of said names,
said middle panel having a plurality of slots each located at one side of a respective one of said names and therefore at one side of a respective one of said windows, and
a plurality of tabs having a closing tab portion extending substantially parallel to said panels and a grasping tab portion extending from said closing tab portion transversely to the latter,
said closing tab portions of said tabs being located behind said front panel while said grasping tab portions of said tabs extending through said windows of said front panel,
said tabs being movable relative to said windows of said front panel and therefore relative to said names of said middle panel so that when one of said tabs is grasped by a user by said grasping tab portion and moved to one position said closing tab portion is moved away of a respective

one of said windows of said front panel into a respective one of said slots of said middle panel and thereby exposes a respective one of said names of said middle panel to show that an object with said exposed name has to be



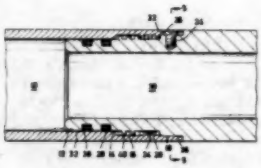
taken care of, and when said one tab is moved in an opposite direction said closing tab portion of said one tab closes said one window of said front panel and covers said one name on said middle panel to show that the object with the previously exposed name has been taken care of.

4,907,828

ALIGNABLE, THREADED, SEALED CONNECTION

Michael C. Chang, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Feb. 16, 1988, Ser. No. 156,206
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **11 Claims**



1. An alignable, threaded, sealed connection for connecting a pair of tubular members in a high-pressure borehole environment, comprising:

a female connector section disposed adjacent one end of the tubular members and having an increased diameter upset bore disposed therein communicating with the end of the tubular member and with a smaller interior bore of the tubular member across an upset shoulder disposed therein, said female connector section further including first upset threads spaced axially from said upset shoulder and disposed axially along said upset bore a first interval, and a first thread relief groove spaced interiorly thereof between said first upset thread and said upset shoulder;

a male connector section disposed adjacent one end of the other of the tubular members and including a reduced diameter upset cylindrical plug with a first cylindrical portion adjacent said plug end having a first reduced diameter for mating with the interior bore of said one tubular member carrying said female connector section and a second cylindrical portion intermediate said first cylindrical portion and said other tubular member body having a second reduced diameter for mating with the interior of said upset bore disposed in said female connector section, said male connector section further including second upset threads disposed on said second cylindrical portion and axially spaced from said plug end and axially disposed thereon a second interval for engaging said first upset threads of said female connector section, and a second thread relief groove spaced interiorly thereof between said second upset threads and the tubular member body;

said first thread relief groove extending axially for at least said second interval and having a diameter sufficiently large to accommodate said second upset threads;

said second thread relief groove extending axially for at least said first interval and having a diameter sufficiently small to accommodate said first upset threads;

a first sealing surface comprising the bore through said female connector section and the one tubular member;

a second sealing surface comprising the surface of said cylindrical plug end;

elastomeric seal means disposed between said first and second sealing surfaces for effecting a high pressure seal therebetween;

said first and second upset threads mating upon insertion of said plug section of said male connector section into said upset bore portion of said female connector section and rotation of said pair of tubular members with respect to each other whereby upon continued rotation of said tubular members said plug section first cylindrical portion mates with said interior bore of said one tubular member for effecting engagement of said elastomeric seal means therebetween and permitting continued axial rotational movement between said male and female connector sections for permitting said first upset threads to be displaced into said second thread relief groove and said second upset threads to be displaced into said first thread relief groove; and

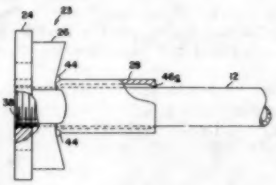
means for securing the tubular members together and preventing relative rotational movement therebetween.

4,907,829

PIPE JOINT ASSEMBLY

Melvin Spangenberg, 4260 Freeman Ave., Hamilton, Ohio 45015

Filed Jan. 5, 1988, Ser. No. 141,292
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **13 Claims**



1. A pipe joint assembly comprising:

a first plate having a bore defined by an inner surface having an inner diameter, said bore being at least partially threaded and adapted to received an externally threaded end of a first pipe, the inner surface in said first plate defining said bore being smooth adjacent to a mouth of said bore;

means for aligning the threaded end of said first pipe with said bore, said means to align comprising:

a cylindrical guide sleeve affixed to said plate and having an inner surface with a larger inner diameter than the inner diameter of said bore; and

an inner surface of said guide sleeve in alignment with the inner surface of said bore for slidably receiving the threaded end of said pipe and for aligning and guiding the

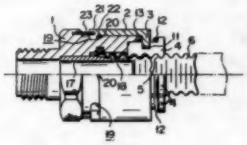
threaded end of said pipe and for aligning and guiding the threaded end of said pipe into said bore in said first plate.

4,907,830

FLUID COUPLING

Takeya Sasa; Yoshikazu Kobayashi, and Reichi Makishima, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,724
Claims priority, application Japan, Nov. 10, 1987, 62-171801[U]
Int. Cl.[4] F16L 55/00
U.S. Cl. 285—91 8 Claims



1. A fluid coupling for a corrugated pipe, comprising:

clamp means having at least one end portion and a coupling body having first and second end portions and an axial through hole, said through hole including a pipe insertion portion, disposed close to the first end portion through which the front end portion of a corrugated pipe is inserted, and a fluid passage portion disposed close to the second end portion; wherein said pipe insertion portion includes a large-diameter portion opening to the one end portion side and housing said at least one end portion of said clamp means, said clamp means includes at least three segments and each of said segments of said clamp means has an inner surface defining the axial through hole, said inner surface having a configuration such as to be able to mate with the external configuration of the corrugated pipe when the clamp means is inserted in the large-diameter portion;

metallic seal means arranged on the fluid passage side the pipe insertion portion, for sealing an end portion of a corrugated pipe pressure against the same;

said at least three segments arranged in the circumferential direction, an axial through hole defined when the segments are arranged in the circumferential direction, and an outside diameter at said at least one end portion such that at least part of the clamp means can be inserted into said large-diameter portion, said clamp means being capable of tightly holding the peripheral portion of the corrugated pipe inserted in the axial through hole; and

retaining means for axially and immovably retaining the clamp means so that the end portion of the corrugated pipe is pressed against the seal means, to be sealed thereby, and

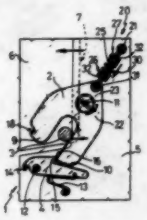
wherein said coupling body has a cylindrical outer peripheral surface on the side of the first end portion thereof, said clamp means has a groove formed on the outer peripheral surface of each of the segments, said groove becoming circumferentially continuous when the segments are assembled into a cylindrical configuration, and said retaining means includes a sleeve having first and second end portions and which is slidable on the outer peripheral surface of the coupling body, said first end portion having a projection protruding radially inward therefrom and adapted to be fitted in the circumferential groove of the clamp means.

4,907,831

CATCH DEVICE WITH AUTOMATIC CLEARANCE COMPENSATION, IN PARTICULAR FOR VEHICLE DOOR LOCKS

Nevio Di Giusto, Venaria, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Mar. 28, 1988, Ser. No. 172,766
Claims priority, application Italy, Mar. 31, 1987, 53182-87[U]
Int. Cl.[4] F05C 3/76
U.S. Cl. 292—216 18 Claims



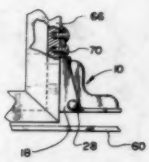
1. A catch device, in particular for a vehicle lock, of the type comprising a fork element rotatably mounted on a first support pin, a striker pin for cooperation with said fork element to cause rotation thereof, and a catch element carried by a second support pin fixedly disposed with respect to said first support pin and cooperable to snap engage with said fork element to lock said fork element in a predetermined position in which said fork element engages said striker pin, said catch device comprising resilient means pivotally secured at one end to said fork element for urging said fork element in rotation about said first support pin and, at its opposite end, to an attachment point fixedly disposed with respect to said first support pin so that said first and second support pins and said attachment point are substantially longitudinally aligned.

4,907,832

SECONDARY LOCKING MECHANISM

Whitley Pemberton, Davis, Ill., assignor to Truth Incorporated, Owatonna, Minn.

Filed Aug. 29, 1988, Ser. No. 237,956
Int. Cl.[4] E05C 3/00
U.S. Cl. 292—228 9 Claims



1. Secondary locking mechanism for a sliding closure movable in a frame comprising, a lock mounted to the sliding closure and a stop block with an inclined end mounted to a sill of said frame, said lock having a mounting bracket, an L-shaped stop arm having an apex and two arm segments generally at right angles to each other, and means for pivotally mounting the stop arm at said apex to the mounting bracket with the stop arm having an inactive position with one arm segment extending substantially parallel to the mounting bracket and an active position wherein said one arm segment is angled away from the mounting bracket, the other arm segment defining a foot which in the active position of the stop arm is at an angle extending downwardly from the pivot

mounting at said apex to lie in the path of the inclined end of the stop block.

4,907,833

OUTSIDE HANDLE DEVICE FOR USE IN A VEHICLE

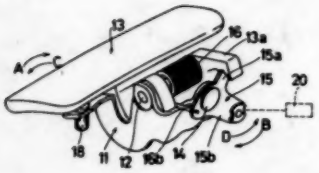
Shinji Ogasawara, Hekinan; Yukio Isomura, Chiryu, and Tetsurou Tanimoto, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 23, 1988, Ser. No. 289,382

Claims priority, application Japan, Dec. 24, 1987, 62-196465[U]

Int. Cl.[4] E05B *3/00*

U.S. Cl. 292—336.3 **6 Claims**



1. An outside handle device for use with a vehicle, comprising:

a stationary base;

a handle pivotably mounted on said base;

a spring provided on said handle and having one end engaging said handle and urging said handle to an initial position thereof; and

a bell-crank operatively connected to a door latching mechanism and engaged with the other end of said spring, said other end of said spring urging said bell-crank to an initial position thereof.

4,907,834

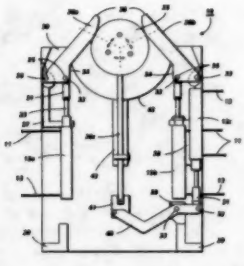
MULTI-FINGER HYDRAULIC END EFFECTOR

Joannes N. M. dejong, Suffern; Edward J. Solcz, Yorktown Heights, and Edward J. Wrobbel, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,691

Int. Cl.[4] B25J *15/10*

U.S. Cl. 294—88 **4 Claims**



1. An end effector for a robotic mechanism to enable prehensile operation on a cylindrical part having an outer surface and an axis, comprising:

a housing being attached to the robotic mechanism;

a plurality of sets of fingers assembled in the housing, each set containing at least three elongated fingers having first and second ends, the first ends thereof extending from the housing and each set being adapted for coplanar movement in directions radially towards and away from the axis of the cylindrical part;

a plurality of piston operated hydraulic cylinders being fixedly mounted within the housing, each hydraulic cylinder having a piston and a piston rod, the piston rod being connected to the piston at one end with the opposite end portion protruding from the hydraulic cylinder, each hydraulic cylinder being used to extend and withdraw its respective piston rod, there being one cylinder for each finger;

means for connecting the distal end of each protruding piston rod end portion to a respective one of the finger second ends;

hydraulic circuit means for individually and concurrently applying a fluid pressure to the cylinder pistons to cause them to extend their piston rods independently of each other, so that each finger first end is moved independently towards and into contact with the outer surface of the part whether it has a varying diameter or not; and

means to cause the finger first ends contacting the outer surface of the part to apply and hold a predetermined prehensile force thereon, so that the robotic mechanism may move the part to the desired destination.

4,907,835

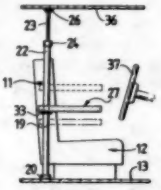
PORTABLE ARM REST APPARATUS

Charles Salters, 5454 Robin Cr., Adamsville, Ala. 35005

Filed Aug. 8, 1988, Ser. No. 229,347

Int. Cl.[4] B60J *9/00*

U.S. Cl. 296—1.1 **17 Claims**



1. A removable arm support apparatus for use in a truck cab having a roof and an accessible floor, said apparatus comprising:

(a) an upright tubular member;

(b) means for resiliently mounting said tubular member between the roof and the floor of the cab;

(c) means for achoring said tubular member on the floor of said cab;

(d) a rubber washer encircling an outside surface of said tubular member, said washer being selectively positionable along a longitudinal axis thereof;

(e) a flat arm rest member having an aperture proximal one end thereof for insertion of said tubular member, said arm rest member resting atop said washer and projecting normally outwardly from said tubular member.

4,907,836

WIRE HARNESS MOUNTING STRUCTURE FOR MOTOR VEHICLE DOOR

Shinichi Ueda; Michihiro Ohtaka; Yoshiaki Nakayama; Hiroaki Shinba, and Hiroshi Ichikawa, all of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 767,156, Aug. 19, 1985, abandoned. This application Aug. 16, 1988, Ser. No. 233,912

Claims priority, application Japan, Aug. 20, 1984, 59-171467; Aug. 21, 1984, 59-172369; Sep. 4, 1984, 59-133497[U]; Sep. 14, 1984, 59-191664

Int. Cl.[4] B60J *5/00;* **H02G** *3/00*

U.S. Cl. 276—39.1 **11 Claims**

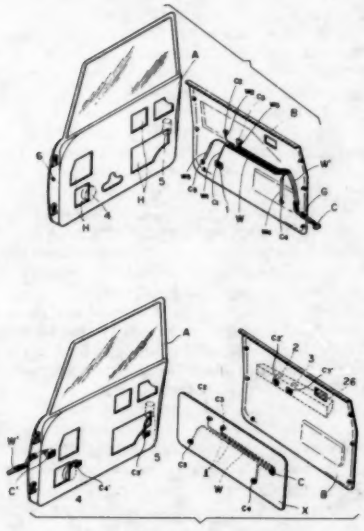
1. A structure mountable on the frame of a hinge-mounted

motor vehicle door for conveniently interconnecting at least one piece of electrical equipment mounted on the door frame with a control device therefore, said structure comprising:

rigid and substantially planar mounting means adapted for detachable mounting on said door frame comprising a rigid covering board having internal and external surfaces for covering the side of said door frame that is internal of the motor vehicle,

a respective control device for each said at least one piece of electrical equipment mounted on said external surface of said covering board, and

a wire harness including a main section and a plurality of branch wires branched from said main section, said main section of said wire harness being flatly and rigidly supported on said internal surface of said covering board, said branch wires having end portions separated from said covering board and being divided into first and second groups, a selected wire of said first group of branch wires being connected to one of the control devices mounted on said covering board, and a selected wire of said second



group of branch wires having a connector at an end thereof which is adapted to be connected to said at least one piece of electrical equipment mounted on said door frame when said covering board has been assembled with said door frame.

2. A structure for quickly and easily mounting a wire harness including a main section and a plurality of branch wires branched from said main section on the frame of a motor vehicle door as to be conveniently connectable to at least one piece of electrical equipment mounted on said door frame, said structure comprising:

rigid planar mounting means adapted to be detachably secured to the side of said door frame that is internal of the motor vehicle, said mounting means comprising a rigid covering board consisting of first and second sections each of generally rectangular shape arranged one above the other and adapted to be independently secured to said door frame, said first section having electric equipment mounted thereon, and means for flatly mounting said main section of said wire harness on said first section of said covering board.

4,907,837

INSECT DIVERTER FOR AUTOMOTIVE VEHICLE WINDSHIELD

Donald A. Yeager, 707 Park St., Bellevue, Iowa 52031

Filed Feb. 27, 1989, Ser. No. 315,994

Int. Cl.[4] B60J *1/20*

U.S. Cl. 296—91 **5 Claims**

1. An insect diverter for attachment to an upper, central, frontal portion of the windshield of an automotive vehicle, comprising a block-like member having a flat rear face adapted for affixation to the windshield and a body projecting forwardly from the base and having upper and lower ends, said body including a through passage extending from end to end, said passage having an air inlet at its lower end and an air outlet at its upper end, said passage being configured to cause vehicle-travel-induced airflow through the passage to emit vibrations effective to divert flying insects to turn away from the path of the vehicle.

4,907,838

VEHICLE BODY ASSEMBLY

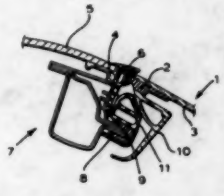
Derek J. Reaney, Nuneaton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Filed Aug. 8, 1988, Ser. No. 230,014

Claims priority, application United Kingdom, Aug. 7, 1987, 8718787

Int. Cl.[4] B60J *5/02*

U.S. Cl. 296—202 **7 Claims**



1. A vehicle body assembly comprising a pillar assembly and a vehicle door including a quarterglass frame wherein the quarterglass frame is provided with a channel member which in the closed position of the door extends around at least a part of the pillar assembly to provide support for the pillar assembly in the event of the vehicle overturning and which in the open position of the door is disengaged from the pillar assembly.

4,907,839

WALKER WITH FOLDING SEAT

Eric P. Rose, Canoga Park, and Christopher R. Reed, Lakeview Terrace, both of Calif., assignors to Guardian Products, Inc., Arleta, Calif.

Continuation-in-part of Ser. No. 255,998, Oct. 10, 1988. This application Feb. 7, 1989, Ser. No. 307,697

Int. Cl.[4] A61H *3/04*

U.S. Cl. 297—6 **31 Claims**

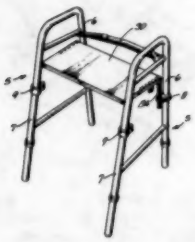
1. A walker with a foldable seat comprising:

at least one front leg;

a plurality of rear legs;

a plurality of clamps, each clamp connected to one of the plurality of legs and each clamp having a tab;

a seat having a plurality of receptacles located at spaced intervals on the underside of the seat, each receptacle corresponding to and adapted to engage one of the tabs for supporting the seat;



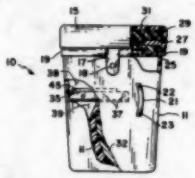
at least one elongated arm pivotally engaged with and extending between a first pivot point located at a seat receptacle adjacent the front edge of the seat and a second pivot point located on a corresponding front leg clamp so that the seat may be moved from an in-use position supported by the tabs to a storage position against the front legs.

4,907,840

COMBINED HASSOCK, NUTCRACKER AND DISPOSAL UNIT

Lendsay W. Hawkins, 347 Ronald Dr., Newport News, Va. 23602

Filed Jun. 26, 1989, Ser. No. 371,220
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—193 **13 Claims**



1. A combination furniture item and a waste disposal kit comprising in combination:

a container having a closed bottom end and an open top end,

a removable top for said container,

means releasably securing said removable top to an exterior surface of said container,

shelf means disposed within and dividing said container into an upper and a lower compartment,

said shelf means being parallel with and spaced from said closed bottom end of said container and extending at least one-half the diameter of said container, and

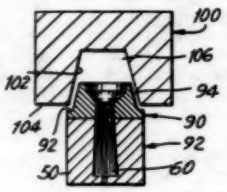
nut cracker means attached to said shelf and accessible through said open end of said container when said removable top is removed therefrom, whereby when nuts are cracked by said nutcracker, the waste nut hulls or shells may be swept off of said shelf into said lower compartment for subsequent disposal thereof.

4,907,841

METHOD OF MAKING A MOLDED BRUSH

Nathan Kay, Encino; Donald McNab, Long Beach, and Edward Moya, San Gabriel, all of, assignors to Photofinish Cosmetics, Inc., Encino, Calif.

Continuation-in-part of Ser. No. 222,808, Jul. 22, 1988. This application Feb. 22, 1989, Ser. No. 313,794
Int. Cl.[4] A46D *3/00*
U.S. Cl. 300—21 **60 Claims**



1. A method of making a brush adapted for applying a flowable fluid to a workpiece, comprising the steps of:

inserting a plurality of elongated filaments forming a tuft of said filaments into a cavity defined in a mold body so that the proximal ends of the filaments are disposed proximate the open end of the cavity, the elongated filaments being formed of a heat-fusible synthetic material;

heating a member to a temperature at least as high as the melting point of the synthetic material and moving the heated member into closely proximate, predeterminately spaced apart relation with the mold body proximate the open end of the cavity so as to cause melting of the proximal ends of the filaments through transmission of heat from the heated member to the proximal ends of the filaments across a space defined between the heated member and the open end of the mold body cavity;

maintaining the heated member in said closely proximate, predeterminately spaced apart relation with the mold body for a time period sufficient to form from the melted filaments a heat-fused wall defining a brush head section at the proximal end of the tuft; and

heating a peripherally-interior portion of said tuft so as to form a substantially flexible membrane extending within and substantially axially along the tuft from said head section toward the distal end of the tuft and thereby define a fluid distribution channel in said brush for feeding fluid through said brush from the head section to the filaments proximate the filament distal ends for selective application of the fluid to a workpiece.

4,907,842

VEHICLE AIR BRAKE SYSTEM AND VALVES FOR IT

Nathan L. Goldfein, Houston, Tex., assignor to International Transquip Industries, Webster, Tex.

Filed Oct. 27, 1988, Ser. No. 263,624
Int. Cl.[4] B60T *17/16*
U.S. Cl. 303—13 **43 Claims**

1. An air brake system for a vehicle comprising

a plurality of air-actuated brakes connected to axles of the vehicle,

a first reservoir for holding air under pressure to be supplied to actuate the air-actuated brakes,

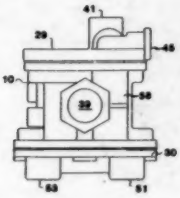
a second reservoir for holding air under pressure to be supplied to actuate the air-actuated brakes,

a multifunction valve in fluid communication via flow lines with the air-actuated brakes, the first reservoir, and the second reservoir, the multifunction valve having a single unitary housing and including within the single unitary housing

pressure protection valve means which permit flow from an

air supply of air under pressure to the first reservoir while preventing such flow to the second reservoir,

pressure reduction valve means for reducing the pressure of the air from the air supply before it flows to the air-actuated brakes,



emergency control valve means for delivering air at a desired pressure to the brakes when air from the air supply ceases to flow, the desired pressure being less than the pressure of the air as supplied by the air supply, and

syncro valve means for delaying actuation of the air-activated brakes until air at a desired air pressure flows to the syncro valve means.

4,907,843

FLUID-PRESSURE OPERATED ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

Denis J. McCann, Powys; Allan Williams; Edwin R. Carswell, both of Gwent, all of Wales, and William S. Broome, Worcestershire, England, assignors to Lucas Industries public limited company, England

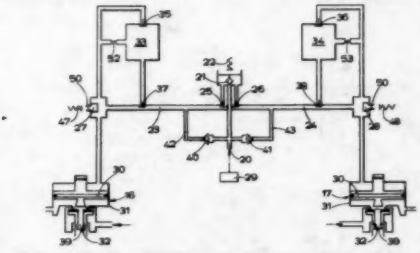
Filed Aug. 5, 1988, Ser. No. 228,981

Claims priority, application United Kingdom, Aug. 19, 1987, 8719550

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] B60T *8/64, 13/70*

U.S. Cl. 303—111 **14 Claims**



1. A fluid-pressure operated braking system for vehicles comprising first and second wheels provided at each end of a common axle, first and second wheel brakes for said first and second wheels respectively, a supply for providing brake-applying operating fluid to each wheel brake, an operating fluid supply line between said supply and each said brake, respective first and second separate independently operable skid control units interposed respectively in said brakes, first and second sensors provided for said first and second wheels respectively to detect the skid point of wheel skids relating to their respective wheels and to provide a skid signal when a skid point is detected, means responsive to a skid signal produced by either of said first or said second sensors, valve means provided to relieve independently the pressure of the fluid supplied to said first and second brakes at a skid point, each said skid control unit comprising a part of a control fluid circuit and each incorporating a memory chamber for storing a memory pressure dependant upon the brake pressure occurring at said skid point to provide a datum or knee point between first and second stages of brake re-application, said valve means being controlled by said means responsive to a skid signal said first and second brakes on said respective first and second wheels each being controlled by a respective one of said separate independently operable skid control units, and a single latch valve provided common to both units, said latch valve closing at the first skid point to be sensed by said first sensor or said second sensor, whereafter the rates of re-application of said first and said second brakes are independently controlled in response to signals from the first and second sensors respectively at a respective initial rate and thereafter at a subsequent rate, said initial rate of brake pressure increase of said first brake being determined by said memory chamber of said first skid control unit and said initial rate of brake pressure increase of said second brake being determined by said memory chamber of said second skid control unit, said subsequent rate of brake re-application being controlled by restricted flows of said brake-applying fluid, wherein each of said first and said second skid-control units is independently controlled by control means in response only to corresponding skid signals relating to the first and second wheels respectively.

4,907,844

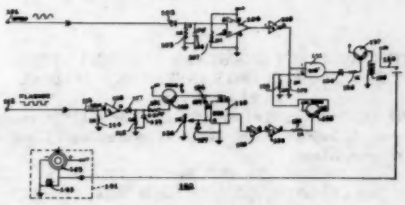
UNCANCELLED TURN SIGNAL INDICATOR

Ralph C. White, 8560 Park La., #34, Dallas, Tex. 75231

Filed Mar. 27, 1989, Ser. No. 328,665

Int. Cl.[4] B60Q *1/00, 1/40*

U.S. Cl. 340—457 **6 Claims**



1. An uncancelled turn signal indicator for use with a vehicle having at least one turn signal indicator, the uncancelled turn signal indicator comprising:

speed sense means for providing a speed sense signal when said vehicle's speed at least equals a predetermined speed;

turn signal indicator sense means for sensing activation and deactivation of said turn signal indicator;

duration sense means responsive to said turn signal indicator sense means for providing an output signal when said turn signal indicator has been continuously activated for more than at least a predetermined period of activation;

logic means responsive to said speed sense signal and said output signal for providing a trigger signal when both said speed sense signal and said output signal are present; and

indicator means responsive to said trigger signal for providing an indication to a driver of said vehicle that said turn signal indicator has not been cancelled.

4,907,845

BED PATIENT MONITORING SYSTEM

Ron Wood, P.O. Box 35446, Tulsa, Okla. 74153

Filed Sep. 16, 1988, Ser. No. 245,227

Int. Cl.[4] G08B *23/00*

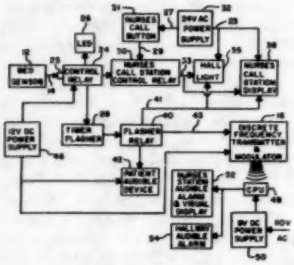
U.S. Cl. 340—573 **35 Claims**

1. In a confined bed patient alarm system for use in conjunction with a call alarm system having signal means operable by a patient to provide a first alarm signal to a call alarm device in

a first mode circuit, apparatus means for providing a second alarm signal to the call alarm to operate the call alarm in a second mode distinguishable from the first mode, which circuit apparatus means comprises:

Means for detecting a parameter indicative of patient movement;

Control means responsive to said detecting means for supplying a movement signal indicative of such movement;



Means responsive to such movement signal for deactivating the signal means operable by a patient to operate the call alarm device in the first mode; and

Means responsive to such movement signal for providing a second alarm signal to operate the call alarm device in the second mode distinguishable from the first mode.

4,907,846

THICK, IMPACT RESISTANT ANTIREFLECTION COATINGS FOR IR TRANSPARENT OPTICAL ELEMENTS

Randal W. Tustison, Lexington, and Dennis G. Montanari, Townsend, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 20, 1987, Ser. No. 123,491

Int. Cl.[4] G02B *1/10, 5/28*; G32B *18/00, 33/00*

U.S. Cl. 350—1.6 **16 Claims**

1. An optical element comprising:

a base comprising a first material having a first predetermined optical transmissivity over a predetermined range of optical wavelengths, and a first predetermined modulus of elasticity;

a composite layer disposed on said base layer to protect said base layer from liquid impact erosion comprising:

a first layer of a second, different material having a second substantially higher modulus of elasticity than the modulus of elasticity of the first material, said layer having an optical thickness of about $(2N+1)\lambda/2$, where λ is a wavelength within the predetermined range of optical wavelengths of the first material of the base and N is an integer; and

a second layer of a third, different material having a third modulus of elasticity which is substantially higher than the modulus of elasticity of the first material, a index of refraction at the wavelength selected to antireflection correct the optical element, and an optical thickness of about $(\lambda/4)$.

4,907,847

OPTICAL PICKUP AND HOLOGRAM THEREFOR

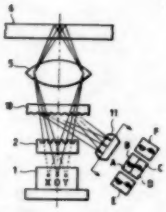
Shuichi Onayama, and Kazuhiko Nosaka, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan

Filed Aug. 2, 1988, Ser. No. 227,330

Claims priority, application Japan, Sep. 28, 1987, 62-243488; Sep. 28, 1987, 62-243489

Int. Cl.[4] G02B *5/32*

U.S. Cl. 350—3.73 **4 Claims**



1. A hologram having a beam splitter and focusing error detection, comprising:

a first diffractive surface, comprising two areas for respectively forming light beams which are focused on two different points; and

a second surface which comprises a diffraction grating for splitting an incident light beam into three light beams.

4,907,848

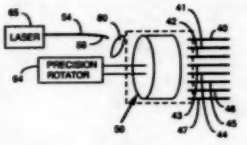
HOLOGRAPHIC ROTARY AND LINEAR ENCODER AND METHOD

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 12, 1988, Ser. No. 231,334

Int. Cl.[4] G02B *5/32*

U.S. Cl. 350—3.75 **10 Claims**



1. An optical signal encoder for determining the position of an object, comprising:

a light source;

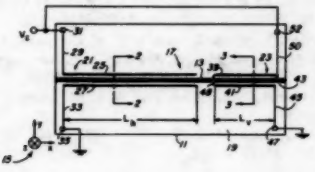
a holographic element having a plurality of holograms formed thereon and arranged to receive light from the light source such that one of the holograms is illuminated, each hologram being configured to receive an input light beam from the light source and to produce therefrom one or more optical output signal beams encoded to correspond to a digital word indicative of the location of the hologram illuminated by the light source; and

a fiber optic array including a plurality of optical fibers arranged to receive the optical signal beams output from the holographic element, the particular optical fibers receiving optical signal beams output from the holographic element being indicative of the location of the hologram illuminated by the light source.

4,907,849
INTEGRATED-OPTIC, POLARIZATION-SELECTIVE PHASE MODULATOR

Alan D. Kersey; Catherine Bulmer, both of Springfield, and Anthony Dandridge, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1988, Ser. No. 233,519
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 **9 Claims**



1. An integrated-optic, polarization-selective phase modulator comprising:

a unitary substrate;

a channel waveguide extending longitudinally along said unitary substrate for providing a path therethrough for polarized light having first and second polarization components; and

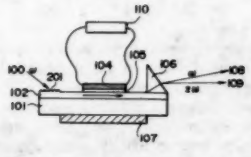
first and second configurations of electrodes respectively disposed in proximity to first and second portions of said channel waveguide;

said first and second configurations of electrodes being responsive to the applications of a control voltage to each of said first and second configurations for operating on each of said first and second polarization components differently so that substantially only one of the first and second polarization components of the polarized light is phase modulated by the application of said control voltage thereto.

4,907,850
APPARATUS FOR PERIODICALLY GENERATING SECOND HARMONIC

Keisuke Araki, Tokyo, and Kenichi Ohta, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,973
Claims priority, application Japan, Jul. 17, 1987, 62-179664; Jul. 20, 1987, 62-180798
Int. Cl.[4] G02B *5/14*
U.S. Cl. 350—96.13 **6 Claims**



1. An apparatus for periodically generating a second harmonic light comprising:

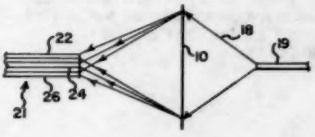
a light source, and

means for converting a fundamental wavelength light emitted from said light source to a second harmonic light, including optical wave guide means having a light propagation area and means for time-periodically varying a refractive index of the light propagation area over a range that includes at least one state which permits phase matching.

4,907,851
SINGLE-MODE 1×N HOLOGRAPHIC FIBER OPTICS COUPLER

Michel E. Marhic, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Sep. 22, 1987, Ser. No. 99,548
Int. Cl.[4] G02B *6/34*
U.S. Cl. 350—96.19 **15 Claims**



1. A holographic 1×N single-mode fiber optic coupler for dividing a substantially monochromatic single-mode fiber optics input into N single-mode outputs, comprising:

input means for input of a substantially monochromatic single-mode fiber optical signal;

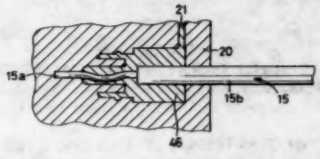
holographic means for holographically imaging the substantial monochromatic single-mode fiber optical signal into a predetermined array of N substantially monochromatic single-mode optical signals; and

output means for coupling the N optical signals to N output optical fibers.

4,907,852
OPTICAL FIBER CONNECTOR AND METHOD FOR PRODUCING THE SAME

Kunihiro Noba, Nagoya; Yukio Sakuraba, and Katsuyoshi Urano, both of Kasugai, all of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jan. 30, 1989, Ser. No. 303,893
Claims priority, application Japan, Feb. 5, 1988, 63-26379; Feb. 18, 1988, 63-20152[U]; Dec. 19, 1988, 63-164726[U]
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **7 Claims**



1. An optical fiber connector assembly for optically connecting end to end a first optical fiber and a second optical fiber, each of said optical fiber having a core and a sheath covering said core, said assembly comprising:

an end portion of said first optical fiber, said end portion consisting of an exposed portion of said core which is exposed at one end of said first optical fiber by removal of a corresponding part of said sheath, and a terminal portion of said sheath adjacent to said exposed portion of the core; and

a connector integrally formed of a synthetic resin in bonded relation with an outer circumferential surface of said end portion of said first optical fiber, said connector including a body portion in which said terminal portion of said sheath is fixedly accommodated, and a connecting portion

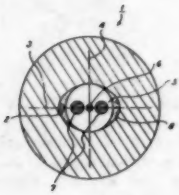
which integrally extends from said body portion and in which said exposed portion of said core is fixedly accommodated in coaxial relation with said connecting portion, an extreme end of said exposed portion of said core being exposed at an end of said connecting portion, for optical connection with an extreme end of said second optical fiber.

4,907,853

OPTICAL CONNECTOR USING A POLARIZATION-MAINTAINING OPTICAL FIBER

Toshio Hiratsuka, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 5, 1987, Ser. No. 117,627
Claims priority, application Japan, Nov. 6, 1986, 61-262683
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 20 Claims



1. An optical connector using a polarization-maintaining optical fiber, comprising:

polarization-maintaining optical fiber means for maintaining a polarization plane by applying stress in a direction perpendicular to the optical axis of the optical fiber means, said optical fiber means including a core and stress-applying means arranged symmetrically with respect to the core;

ferrule means into which said polarization-maintaining fiber means are inserted, and whose section perpendicular to said optical axis has an oval hole, the major axis of said oval hole coinciding with the direction in which the stress is applied to said core of said polarization-maintaining optical fiber means, and the minor axis of the same being approximately equal to the diameter of said polarization-maintaining optical fiber means; and

adhesive means for fixing said polarization maintaining optical fiber means in said hole.

4,907,854

SPACER FOR CARRYING OPTICAL FIBERS

Takayoshi Nakasone, Koriyama, and Kazuo Yasuda, Gifu, both of Japan, assignors to Ube-Nitto Kasei Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00598, § 371 Date Dec. 6, 1988, § 102(e) Date Dec. 6, 1988, PCT Pub. No. WO88/10442, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 17, 1988, Ser. No. 339,823
Claims priority, application Japan, Jun. 17, 1987, 62-91930
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 3 Claims

1. An optical fiber carrying spacer having helical grooves for receiving optical fibers, each groove changing the direction of its helix for each turn about the spacer, wherein each helical groove includes extra-length portions and compensating portions both formed at a smaller angle to a longitudinal axis of the spacer than main groove portions, each of the extra-length portions being provided at a position where the direction of helix changes, and each of the compensating portions being provided between adjacent extra-length portions at an angular distance ranging from $\frac{1}{4}$ to $\frac{1}{2}$ of the circumference of the spacer from the direction changing position.

4,907,855

MARINE CABLE FOR A FIBER OPTIC WAVEGUIDE WITH REGENERATOR SUPPLY

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 9, 1989, Ser. No. 294,861
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1988, 3801409
Int. Cl.[4] B32B 9/00; G02B 6/44
U.S. Cl. 350—96.23 9 Claims

1. A marine cable for a fiber optic waveguide with a regenerator supply line, the marine cable having a central LWL-bundle-conductor wire that is surrounded by at least one stranded layer of high-tensile sheathing wires and by a watertight metal casing, wherein the marine cable further comprises, within the stranded layer of high-tensile sheathing wires, an inner SZ-stranded layer of high-tensile sheathing wires, an inner SZ-stranded layer of conduction embedded in a plastic, water-repellent embedding material, an insulation layer being disposed between the inner stranded layer and the sheathing wires, the embedding material having a specific electrical resistance smaller by at least one order of magnitude than that of the insulation layer.

4,907,856

ACOUSTOOPTIC TRANSDUCER ARRANGEMENT FOR OPTICAL FIBERS

Fred S. Hickernell, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1988, Ser. No. 237,936
Int. Cl.[4] G02B 6/02, 6/16
U.S. Cl. 350—96.29 19 Claims

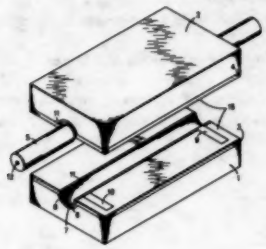
1. An acoustooptic transducer for acoustooptic coupling to light waves traveling through an optical fiber, said acoustooptic transducer arrangement comprising:

body means including first and second portions, each of said first and second portion of said body means including channel means located axially along a surface of each portion and said channel means adapted to circumscribe said optical fiber;

piezoelectric means disposed about the surface of said channel means of said first and second portions of said body means, said piezoelectric means operating in response to an electric signal to produce an acoustic wave focused upon said optical fiber;

said optical fiber being positioned directly in contact with said piezoelectric means so that a channel means circumscribes a predetermined length of optical fiber; and

said first and second portions of said body means being positioned about said optical fiber so that said optical fiber is in direct contact with said piezoelectric means of said channel means, said first and second portions being



bonded so that said piezoelectric means is coaxially oriented along said predetermined length of said optical fiber, whereby said acoustic waves are focused on said transmitted light waves of said optical fiber.

4,907,857

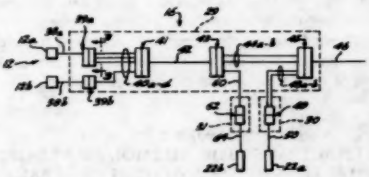
OPTICAL FIBER DISTRIBUTION SYSTEM FOR AN OPTICAL FIBER SENSOR

David Giuliani, Mercer Island, and Robert A. Gutcheck, Bothell, both of Wash., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 224,442, Jul. 25, 1988, abandoned. This application Jun. 14, 1989, Ser. No. 366,762

Int. Cl.[4] G01D *5/30, 5/34;* **G01J** *5/42*

U.S. Cl. 350—96.29 **18 Claims**



1. A distribution system for a sensor that utilizes an analyte-sensitive indicator molecule to monitor the concentration of an analyte, the sensor having: a signal-generating component for producing first and second optical signals of distinct wavelengths, the first signal wavelength being such that the signal intensity is altered by the indicator molecule in proportion to the presence of the analyte, the second signal wavelength being such that the intensity of the signal is predictably altered by the indicator molecule so that the intensity of the returned signal is predictable; a single-fiber sensor tip that includes the indicator molecule; and a signal-measuring component for receiving signals from the distribution system, the distribution system comprising:

lengths of optical fiber of first and second diameters, said second diameter being larger than said first diameter;

a dividing connector for connecting at least three intermediate fibers of said first diameter to the signal-generating component to thereby receive intermediate signals, at least one intermediate signal corresponding to the wavelength of the first signal and one intermediate signal corresponding to the wavelength of the second signal;

a mixing connector for connecting a mixing fiber of said second diameter to said intermediate fibers to thereby receive said intermediate signals and blend them into a single mixed signal, said mixing fiber being of a suitable length to mix the first and second signals into a single mixed signal distributed uniformly across said mixing fiber;

a transmitting connector for connecting a transmitting fiber of said first diameter to said mixing fiber to thereby receive a portion of said mixed signal; and

a tip connector for connecting said transmitting fiber to the sensor tip fiber to thereby transmit said mixed signal to the sensor tip, and for connecting an indicator fiber of said first diameter to the sensor tip to thereby transmit a portion of the resulting indicator signal returned from the sensor tip to the signal-measuring component, whereby the intensity of said intermediate signals corresponding to the first signal is maximized at the dividing connector, the intensity of said intermediate signals corresponding to the first signal being bounded by the transmission of intermediate signals corresponding to the second signal of adequate intensity such that the intensity of the indicator signal of a wavelength corresponding to the wavelength of the second signal received by the signal-measuring component is suitable for monitoring the operation of the distribution system.

4,907,858

OPTICAL PICKUP APPARATUS

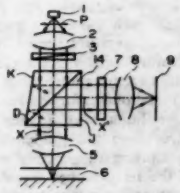
Hiroshi Hara; Hiraku Sonobe; Makoto Shibou, all of Yokohama; Osamu Koyama, Hachioji; Masamichi Tateoka, Yokohama; Koichi Ida, Tokyo, and Hideaki Yano, Kokubunji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 761,501, Aug. 1, 1985, abandoned. This application Apr. 21, 1988, Ser. No. 185,372

Claims priority, application Japan, Nov. 16, 1984, 59-242051

Int. Cl.[4] G02B *5/04, 27/14*

U.S. Cl. 350—286 **7 Claims**



1. An optical pickup apparatus comprising:

a light source for applying a light beam to an optical memory medium;

a beam splitter disposed in the optical path from said light source to the medium to separate the reflected beam from the medium from the beam from said light source, said beam splitter consisting of a plurality of prisms joined together; and

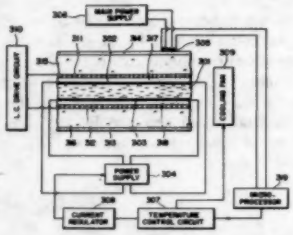
a photodetector for detecting the separated reflected beam, the surface of said beam splitter which faces said photodetector being perpendicular to the optical axis of the separated reflected beam, and the surface of said beam splitter that is opposed to said surface facing said photodetector being non-parallel with said surface of said beam splitter facing said photodetector.

4,907,859

LIQUID CRYSTAL DEVICE AND IMAGE FORMING APPARATUS UTILIZING LIQUID CRYSTAL DEVICE

Yoshihiro Takada, Yokohama, and Nagao Hosono, Hachioji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 45,769, Apr. 28, 1987, Pat. No. 4,763,992, which is a continuation of Ser. No. 670,905, Nov. 13, 1984, abandoned. This application May 25, 1988, Ser. No. 205,685
Claims priority, application Japan, Nov. 15, 1983, 58-215724
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—331 T **20 Claims**



1. An electro-optical switching apparatus for forming an image comprising:

(a) a light source for emitting light rays;

(b) a light-path switching means comprising

(i) a first base plate having scanning lines,

(ii) a second base plate having data lines,

(iii) a ferroelectric liquid crystal disposed between the first and second base plates,

(iv) a driving means for driving the ferroelectric liquid crystal by selective application of signals to the scanning lines and the data lines so as to cause the ferroelectric liquid crystal to assume either one of light-transmitting state and light-interrupting state;

(c) a temperature sensor for detecting the temperature of the ferroelectric liquid crystal and for generating an output response therefrom;

(d) a heating means for raising the temperature of the ferroelectric liquid crystal, said heating means comprising a resistance heater disposed on one of the base plates; and

(e) a temperature-controlling means which, during the operation of said light-path switching means, receives said output from the temperature sensor for comparing the detected temperature with a predetermined operational temperature within a temperature range providing a ferroelectric liquid crystal phase, for restoring the temperature of the ferroelectric liquid crystal when the detected temperature is lower than the predetermined operational temperature by causing the heating means to raise the temperature of the ferroelectric liquid crystal until said detected temperature is above said predetermined temperature and thereafter cooling the ferroelectric liquid crystal to a temperature below said predetermined temperature, and for causing the heating means to maintain the temperature of the ferroelectric liquid crystal to be substantially constant.

4,907,860

THREE DIMENSIONAL VIEWING GLASSES

Lowell A. Noble, 18138 Bancroft Ave., Monte Serreno, Calif. 95030

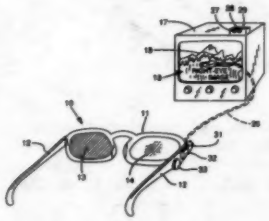
Filed Mar. 3, 1988, Ser. No. 163,856
Int. Cl.[4] G02F *1/133*; G02C *1/00*; A61B *3/00*; H04N *13/00*
U.S. Cl. 350—334 **4 Claims**

1. A pair of three-dimensional viewing glasses for viewing a screen with separate right-eye and left-eye images presented in a time-divided three-dimensional system wherein the right-eye image and the left-eye image alternate on the screen, comprising:

a right lens and a left lens, each lens comprising a laminate with liquid crystal means between two layers of clear sheet material for obscuring vision through that lens in an "OFF" state and for providing clear view through the lens in an "ON" state in response to receipt of a control signal,

a pair of frames for supporting the lenses,

signal conducting means for carrying a control signal from the three-dimensional system to the liquid crystal means of each lens, to control the alternating state of each lens,



the liquid crystal means comprising a large number of droplets of liquid crystal material encapsulated in transparent latex material and sandwiched between two layers of clear sheet material, and including means responsive to receipt of the control signal for establishing an electrostatic field between the two sheet material layers in the "ON"0 state, effective to align liquid crystals in the droplets substantially with the direction in which the light from the image travels through the lens,

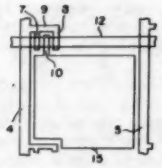
and the latex material having added to it a dark pigment, for improving the contrast ratio of what is viewed in the "ON" condition by absorbing light scattered transversely to the line of sight in the "ON" state, whereby dark sections of the screen are made to appear darker.

4,907,861

THIN FILM TRANSISTOR, METHOD OF REPAIRING THE FILM TRANSISTOR AND DISPLAY APPARATUS HAVING THE THIN FILM TRANSISTOR

Ryujiro Muto, Fujisawa, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 853,740, Apr. 18, 1986, abandoned. This application Jul. 12, 1988, Ser. No. 219,871
Claims priority, application Japan, Apr. 23, 1985, 60-85456
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—336 **12 Claims**



1. A thin film transistor connected to a picture element displaying electrode formed on an insulating base plate so that a voltage is applied to said electrode, comprising:

a semiconductor layer;

a gate electrode;

a gate insulator formed between said semiconductor layer and gate electrode;

one or more drain electrodes connected to said picture element displaying electrode; and

a source bus line which applies a voltage to one or more source electrodes connected thereto;

wherein said one or more drain electrodes are formed between said source bus line which functions by itself as a source electrode and said one source electrode connected to said source line, or between said source electrodes adjacent to each other, which are connected to said bus line and wherein said gate electrode is formed on said one or more source electrodes, said source bus line and said one or more drain electrodes all of which are formed on said insulating base plate, through a semiconductor layer and wherein said gate electrode, said gate insulator and said semi-conductor layer are all formed substantially in the same pattern and wherein the gate insulator is formed below the entire length of the gate electrode and the semiconductor layer is formed below the gate insulator.

4,907,862

METHOD FOR GENERATING ELECRONICALLY CONTROLLABLE COLOR ELEMENTS AND COLOR DISPLAY BASED ON THE METHOD

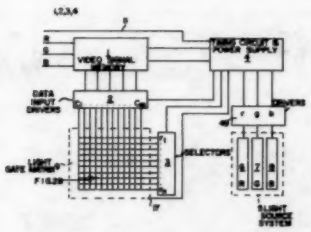
Tuomo S. Suntola, Espoo, Finland, assignor to Oy Lohja Ab, Virkkala, Finland

Continuation of Ser. No. 832,721, Feb. 25, 1986, abandoned. This application Apr. 18, 1989, Ser. No. 341,236

Claims priority, application Finland, Mar. 5, 1985, 850874

Int. Cl.[4] G02F *1/133, 1/23;* **H04N** *9/30*

U.S. Cl. 350—345 **18 Claims**



1. A method using video signal lines for generating picture elements with individual color control on a color display screen, using at least two light gates and a common light source system for the light gates, and emitting separately at least two primary colors wherein the light source system is activated separately for each primary color to generate a switched light source that incorporates the different primary color components, and by using control circuits for controlling the transmission of each light gate to achieve the desired color intensity, said method comprising:

generating the primary color components in the light source system as alternating light cycles, and emitting one primary color at a time, with a repetition frequency of at least 25 Hz,

generating each picture element color by adjusting the transmission of each light gate synchronously with a primary color emission cycle of each primary color component in a ratio required to generate the desired additive color perception; and

dividing a basic sequence of each video signal line cycle by the number of primary colors to provide a corresponding number of sequential sub-sequences, and dividing each sub-sequence further into basic operating cycles t_i and t_o, and using t_i for transferring the video signal information to each light gate with the light source not activated, and using t_o for activating the light source system to generate a light pulse of the corresponding primary color.

4,907,863

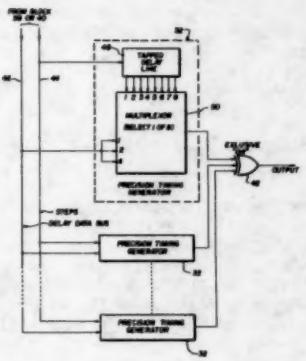
DIGITAL FREQUENCY SYNTHESIZER FOR USE WITH PRECISION AO SCANNING AND POSITIONING

J. Bradford Merry, Annapolis, and Thomas Hubin, Laurel, both of Md., assignors to Chesapeake Laser Systems, Inc., Lanham, Md.

Filed Sep. 22, 1988, Ser. No. 247,831

Int. Cl.[4] G02F *1/33*

U.S. Cl. 350—358 **9 Claims**



1. An AO controlled laser scanning system comprising laser means, AO laser beam scanner means, means to feed the laser beam from said laser means into said scanner means, clock means producing a first stream of clock pulses at a constant period, circuit means for producing an output stream of pulses of predetermined configuration and predetermined period based on said clock pulses, means to feed said output stream of pulses to said scanner means, said pulse producing circuit means comprising means which control the start time and ending time of each pulse in said output stream of pulses individually, said pulse producing circuit means comprising pulse forming means and control means for said pulse forming means, and means to provide pulse forming signals from said pulse forming control means to said pulse forming means with relation to said clock pulses and with relation to said predetermined configuration and predetermined period to produce said output stream of pulses.

4,907,864

MACRO-GRADIENT OPTICAL DENSITY TRANSMISSIVE LIGHT CONCENTRATORS, LENSES AND COMPOUND LENSES OF LARGE GEOMETRY

James J. Hagerty, Saratoga, and Leslie A. Danziger, Los Altos Hills, both of Calif., assignors to John E. Fetzer Foundation, Kalamazoo, Mich.

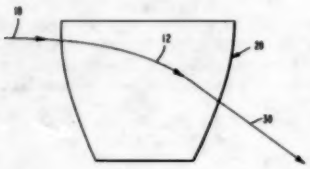
Continuation-in-part of Ser. No. 87,598, Aug. 19, 1987, abandoned. This application Jun. 17, 1988, Ser. No. 206,110

Int. Cl.[4] G02B *3/00*

U.S. Cl. 350—413 **55 Claims**

1. A light directing device comprising: a transmissive refractive material having an optical axis, an entrance surface and an exit surface, the optical axis passing through the entrance surface and through the exit surface, said light directing device further having a bidirectional gradient in the refractive index thereof, the gradient changing in a direction perpendicular to the optical axis and changing in a direction parallel thereto in the direction from the entrance surface to the exit surface of the refractive medium, said entrance surface comprising a

material of a first composition having a first refractive index of refraction and said exit surface comprising a second material



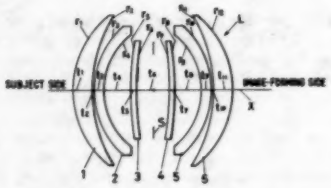
having a second index of refraction, said gradient derived from a gradient in composition between said first and said second compositions.

4,907,865

VARIABLE MAGNIFICATION DUPLICATOR LENS SYSTEM

Aiko Ichiki, and Nagayoshi Hirano, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Dec. 23, 1988, Ser. No. 289,269
Claims priority, application Japan, Dec. 25, 1987, 62-331378
Int. Cl.[4] G02B *15/00, 9/62*
U.S. Cl. 350—425 **7 Claims**



1. A variable magnification duplicator lens system which comprises:

front and rear lens groups each consisting of three lens elements located on each side of a stop, three on the subject side and three on the image-forming side of the stop;

the lens elements on the subject side of said stop including a 1st lens element consisting of a meniscus lens having positive power and facing the convex side thereof toward the subject, a 2nd lens element consisting of a meniscus lens having negative power and facing the convex side thereof toward said subject, and a 3rd lens element having positive power;

the lens elements group on the image-forming side of said stop including 4th to 6th lens elements arranged symmetrically with said 1st to 3rd lens elements on the subject side, respectively;

at least one of said 1st and 6th lens elements being movable said lens system as a whole being moved in the direction of the optical axis at the time of varying the copy scale;

in reduced scale position, the lens position being adjusted by at least one of lens shifts, a shift moving said 6th lens element toward said 5th lens element and a shift moving said 1st lens element away from said 2nd lens element; and

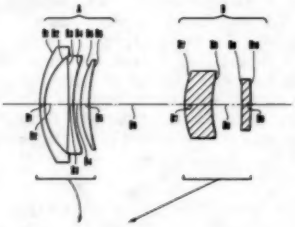
in enlarged scale position, the lens position being adjusted by at least one of lens shifts, a shift moving said 1st lens element toward said 2nd lens element and a shift moving said 6th lens elements away from the 5th lens element.

4,907,866

OBJECTIVE OF VARIABLE FOCAL LENGTH

Nozomu Kitagishi, Tokyo; Hiroki Nakayama, Kanagawa; Shigeyuki Suda, Tokyo; Jun Hattori, Kanagawa, and Akihisa Horiuchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1986, Ser. No. 847,236
Claims priority, application Japan, Apr. 5, 1985, 60-072031; Apr. 25, 1985, 60-089193; Apr. 26, 1985, 60-090127
Int. Cl.[4] G02B *15/177*
U.S. Cl. 350—426 **18 Claims**



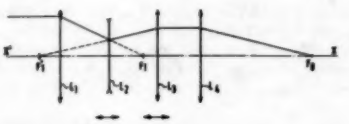
1. An objective of variable focal length comprising a plurality of lens units, of which the first lens unit, counting from an object side, has a negative refractive power and a second unit has a positive refractive power, at least said first and said second lens units being moved axially with their air separation being varied to vary the focal length of the entire system, whereby at least one of said lens units includes at least one refractive index distribution type lens varying in refractive index that is arranged on a common optical axis with said plurality of lens units, wherein said refractive index distribution type lens comprises a distribution of refractive indexes so that a change in aberrations due to a variation of the objective focal length is restricted.

4,907,867

VARIFOCAL OPTICAL SYSTEM AND ASSOCIATED ELECTRO-MECHANICAL CONTROL

Jean-Claude Perrin, Macon, and Joel Rollin, Vanves, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,772
Claims priority, application France, Jun. 4, 1987, 87 07797
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—429 **7 Claims**



1. A varifocal optical system controlled electro-mechanically for focal distance variation and thus magnification, temperature correction focussing and finite distance focussing, comprising four single element lenses, two of said lenses being movable and axially translatable to vary the magnification, only one of the two movable lenses being adapted for temperature correction focussing and finite distance focussing, and electro-mechanical means for controlling the movement of the two movable lenses in a discrete manner.

4,907,868

OPTICAL SYSTEM FOR DEFLECTING IMAGE

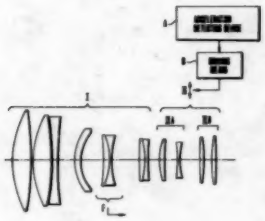
Nozomu Kitagishi, Kanagawa, and Shoichi Yamazaki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 156,930

Claims priority, application Japan, Feb. 18, 1987, 62-035266; Sep. 29, 1987, 62-245247; Oct. 30, 1987, 62-276717; Nov. 20, 1987, 62-293133

Int. Cl.[4] G02B *27/64*

U.S. Cl. 350—463 16 Claims



1. An optical system for correcting image blurring comprising, from front to rear, a fixed lens unit stationary relative to a direction perpendicular to the optical axis, and a movable lens unit with means for moving said movable lens unit in a direction having a directional component transverse to the optical axis to stabilize an image, said movable lens unit including a plurality of lenses, and satisfying the following condition:

$$0.05 < L_2/F < 0.4$$

where L_2 is the length from a frontmost lens surface in said movable lens unit to a rearmost lens surface therein, and F is the focal length of the entire lens system.

4,907,869

TILTABLE OUTSIDE REARVIEW MIRROR FOR A VEHICLE

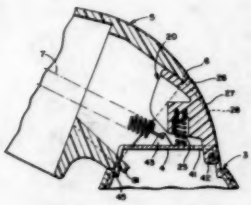
Christoph Schwarz, Freudenberg, and Herwig W. Polzer, Miltenberg, both of Fed. Rep. of Germany, assignors to Hohe KG, Collenberg, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,123

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 8804802[U]

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—604 13 Claims



1. An outside rearview mirror for a vehicle comprising:

a pedestal adapted to be mounted to a body of the vehicle,

a mirror housing tiltably mounted to said pedestal for rearward movement relative to said pedestal out of a position of normal use,

means for holding said mirror housing in the position of normal use at the pedestal,

an edge of said mirror housing bearing against a shoulder of said pedestal when said mirror housing assumes the position of normal use,

a spherical cap being mounted to the pedestal and covered by the mirror housing in the position of normal use thereof a curvature of the cap being centered to a rearward edge section of the mirror housing,

a portion of the said edge riding on an outer periphery of said cap when the mirror housing tilts rearwardly.

4,907,870

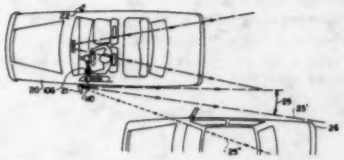
DEVICE TO MANIPULATE SIDE VIEW MIRRORS FOR MOTOR VEHICLES

Milton Brucker, 10110 Empyrean Way, Los Angeles, Calif. 90067

Continuation of Ser. No. 37,255, Apr. 10, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,340

Int. Cl.[4] B60R *1/08;* G02B *7/18, 5/08*

U.S. Cl. 350—637 12 Claims



1. A motor vehicle side view mirror assembly comprising;

(a) a mirror housing attachable to a motor vehicle;

(b) a mirror mounting plate within said housing and pivotally affixed thereto about a generally vertical axis;

(c) a mirror within said housing spaced from and extending in generally parallel relationship to said mounting plate, said mirror being supported by said mounting plate and pivotal with respect thereto about a generally vertical axis;

(d) means associated with the mirror mounting plate for adjusting said place and supported mirror to a normal side viewing position;

(e) at least one electrical solenoid means mounted on the mirror mounting plate, each solenoid means having an actuating arm movable upon electrical energization of said solenoid means between extended and retracted positions;

(f) means operatively connecting the actuating arm of each solenoid means to the mirror such that upon extension and retraction of said arm the mirror is caused to pivot about its generally vertical axis between its normal side viewing position and a swept viewing position to eliminate blind spots; and

(g) electrical control means connected to the electrical solenoid means so as to control the extension and retraction of the actuating arm and thereby the position of the mirror.

4,907,871

TELESCOPIC EXTERIOR REAR VIEW MIRROR

Mei-Wen H. Hou, No. 24, Lane 103, Kun Shan St., Ku Shan Tsun, Yung Kang Hsiang, Tainan, Taiwan

Filed Jul. 12, 1989, Ser. No. 378,980

Int. Cl.[4] B60R *1/06;* G02B *5/08*

U.S. Cl. 350—639 2 Claims

1. A telescopic exterior rear-view mirror for motor vehicles comprising:

a first side mirror device having a housing carrying a first mirror and having a first side wall, a second side wall opposed to the first side wall having an opening and said housing having an inner chamber;

secure means for securing the housing to the body of the motor vehicle;

a first ball joint connector rotatably and adjustably intercon-

necting the secure means and the first side wall of the housing;

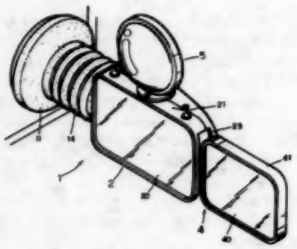
rail means transversely arranged in the housing;

a second side mirror device having a frame member carrying a second mirror facing a direction substantially corresponding to that of the first mirror, adapted to be stored in the chamber of the housing of the first side mirror device, having a lagging side wall and leading side wall respectively corresponding to the first side wall and the second side wall of the housing and movable between a retracted position in the housing and an extended position through the opening in the second side wall of the housing;

an intermediate body having a lagging side and a leading side respectively corresponding to the lagging side wall and leading side wall of the frame member of the second side mirror device;

a second ball joint assembly connector rotatably and adjustably interconnecting the leading side of the intermediate body and the lagging side wall of the frame member of the second side mirror device;

a slide member engaged in the rail means of said housing and attached to the intermediate body for sliding the second side mirror device between a retracted position and an extended position;



a spring unit disposed between the first side wall of the housing and the lagging side of the intermediate body for expelling the second side mirror device from the retracted position into the extended position;

a pair of retaining members opposedly formed on the first side wall of the housing and the lagging side of the intermediate body and having respective recesses for retaining the end portions of the spring unit; and

a lock and release means having a portion board extending across the parallel horizontal side walls of the housing and having a passage formed in a central portion thereof, a spring plate located along a longitudinal edge of the retaining member on the lagging side of the intermediate body frame member and extending outwardly in a direction generally parallel to the partition board, with a free end portion of the spring plate normally positioned beyond the passage of said partition board to lock the second side mirror device in the retracted position and an actuating rod means having an actuating rod pointing inwardly in a direction generally parallel to the partition board with an end adjacent to the free end of the spring and when actuated, said rod moves inwardly to depress the free end of the spring to release the second mirror device from the retracted position.

4,907,872

CONTACT LENS FOR ENABLING TREATMENT OF THE EYE BY LASER

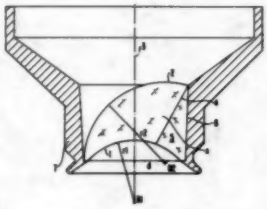
K. E. Schirmer, Montreal, Canada, and Werner Reis, Munich, Fed. Rep. of Germany, assignors to G. Rodenstock Instrumente GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 201,759

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 3718599

Int. Cl.[4] G02C *7/04*; A61B *3/00*

U.S. Cl. 351—160 R **6 Claims**



1. A contact lens for enabling treatment of frontal eye sections with a laser, the contact lens having a surface provided on the eye side with a radius adapted to the radius curvature of the cornea, a frontal surface of the contact lens being decentered with respect to the surface on the eye side, and a reflective surface inclined with respect to the ocular axis for enlarging the field of vision, the reflective surface being a planar area arranged in a part of the contact lens where the axial distance of the surface on the eye side and the frontal surface is at a maximum, the surface on the eye side and the frontal surface forming an aplanatic system, and the surface on the eye side and the frontal surface being disposed so as to almost intersect each other on a part of the contact lens opposite to the reflective surface.

4,907,873

MAGNIFIED IMAGE PROJECTOR APPARATUS

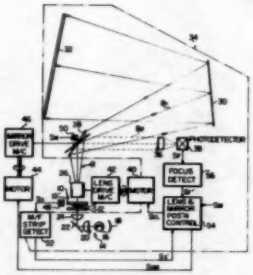
Masaaki Kuriyama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 10, 1988, Ser. No. 205,282

Claims priority, application Japan, Jun. 19, 1987, 62-153047

Int. Cl.[4] G03B *3/00, 21/14*

U.S. Cl. 353—101 **9 Claims**



1. A magnified image projector apparatus comprising:

(a) means for retaining in a predetermined position an image record medium having an image recorded thereon,

(b) means for producing an information-carrying beam of light carrying information representative of the image on said image record medium,

(c) a surface onto which said information-carrying beam is to be projected, said surface being fixed with respect to said predetermined position,

(a) a first lens for projecting said information-carrying beam along a first path of light onto said surface with said image reproduced to a magnified scale on said surface, said first lens being movable along said first path of light with respect to said image record medium in said predetermined position and to said surface,

(e) beam re-directing means located in said first path of light and operative to re-direct said information-carrying beam into a second path of light reflected from and shorter than said first path of light;

(f) focussed state detecting means locating in said second path of light and operative to detect the location at which the information-carrying beam passed through said first lens and re-directed to travel along said second path of light is to be focussed by the first lens, said detecting means being further operative to produce a focus signal having a state dependent on said location,

(g) a second lens located in said second path of light between said beam re-directing means and said detecting means for projecting said information-carrying beam onto said detecting means with said image reduced in scale,

(h) adjusting means operatively connected to said first lens and responsive to the signal from said detecting means for driving the first lens for movement with respect to each of the image record medium in said predetermined position, said surface and said second lens in a direction substantially parallel with said first path of light, and

(i) means for driving said beam re-directing means between a first angular position allowing said information-carrying beam to advance along said first path of light toward said surface and a second angular position allowing said information-carrying beam to advance along said second path of light toward said second lens.

4,907,874

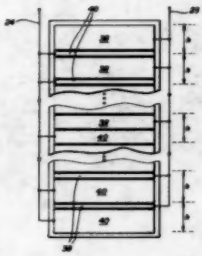
DETECTION AND DISPLAY DEVICE

DuWain K. Ake, Huber Heights, Ohio, assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Aug. 5, 1988, Ser. No. 228,465

Int. Cl.[4] G01C *3/08*; H01J *40/14*

U.S. Cl. 356—4 **9 Claims**



1. A device for detecting and displaying the relative position of a generally horizontal reference plane of light, even when partial shading of said device occurs, comprising:

photodetector means, including first and second interdigitated photodetector elements positioned adjacent each other on said device, said first and second interdigitated photodetector elements providing first and second detection signals, respectively,

circuit means, responsive to said photodetector means, for determining the relative levels of said first and second detection signals such that the position of said reference plane of light with respect to said detector device is determined, and

display means, responsive to said circuit means, for providing an indication of the position of said reference plane of light with respect to said detector device.

4,907,875

DIAMOND SEPARATION PROCESS

Heather J. Bowley, Ashford, and Donald L. Gerrard, West Ewell, both of England, assignors to The British Petroleum Company p.l.c., London, United Kingdom

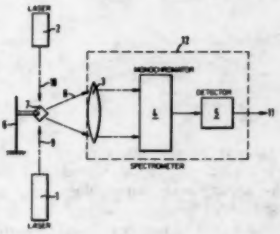
PCT No. PCT/GB88/00022, § 371 Date Sep. 12, 1988, § 102(e) Date Sep. 12, 1988, PCT Pub. No. WO88/05534, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 14, 1988, Ser. No. 252,416

Claims priority, application United Kingdom, Jan. 16, 1987, 8700917

Int. Cl.[4] G01J *3/44*; G01N *21/65, 21/87*

U.S. Cl. 356—30 **13 Claims**



1. A method of assessing the colour type of diamonds comprising the steps of (a) passing incident laser radiation of predetermined intensity at two or more different, pre-determined wavelengths onto a diamond, the laser radiation being capable of causing Raman radiation to be scattered from the diamond, (b) measuring the intensity of the scattered Raman radiation from the diamond for each of the incident laser radiation wavelengths, (c) generating a numerical value characteristic of the colour type of the diamond based on the measured intensities of scattered Raman radiation for the two or more different incident laser radiation wavelengths.

4,907,876

EXAMINATION APPARATUS FOR MEASURING OXYGENATION IN BODY ORGANS

Susumu Suzuki; Sumio Yagi; Naotoshi Hakamata, and Takeo Ozaki, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 2, 1988, Ser. No. 188,957

Claims priority, application Japan, May 8, 1987, 62-110465; May 8, 1987, 62-110472

Int. Cl.[4] G01N *33/49*; A61B *5/00*

U.S. Cl. 356—41 **7 Claims**

1. An examination apparatus for measuring the oxygenation in an object with electromagnetic wave transmission spectrophotometry, comprising:

plural light sources for emitting respective electromagnetic waves with different wavelengths;

light source control means for controlling said plural light sources so as to sequentially emit said electromagnetic waves;

an illumination-side fixture for making said electromagnetic waves introduced from said light sources incident on a measuring object;

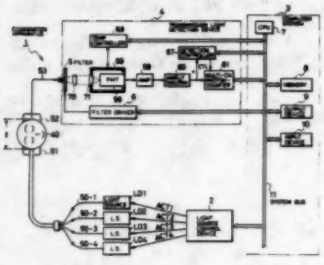
a detection-side fixture for detecting electromagnetic waves transmitted from said measuring object and sending said transmitted electromagnetic waves to transmission light detection means;

said transmission light detection means for detecting said transmitted electromagnetic waves introduced from said

detection-side fixture and outputting transmission light data; and

a computer system for controlling said light source control means and said transmission light detection means, and for receiving said transmission light data from said transmission light detection means and calculating the oxygenation in said measuring object; wherein

said transmission light detection means includes filter means



with a variable transmission factor for attenuating said transmitted electromagnetic waves and filter driving means for setting said transmission factor of said filter means; and

said light source control means and said filter driving means control output powers of said plural light sources and said transmission factor of said filter means, respectively, so that a light quantity outputted from said filter means become suitable for the detection.

4,907,877

LIGHT DESTRIBUTION OF HEADLIGHT BEAM

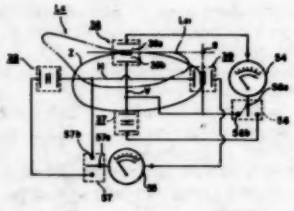
Yutaka Fukuda, #J-401 Kogaimansion-Shintokorozawadanchi,358-15, Kamegane, Tokorozawa-shi, Saitama-ken; Koji Minagawa, 361-31, Chigusa-cho, Chiba-shi, Chiba-ken; Hiroichi Nabeshima, 2225-16, Ohaza-Takahagi, Hidakamachi, Iruma-gun, Saitama-ken; Koichiro Muneki, 1-8-12, Asahigaoka, Hino-shi, Tokyo; Yoshikatsu Asano, 1-6-6-302, Tate, Shiki-shi, Saitama-ken; Kazuo Aoki, 203-5, Ohya-cho, Hachiohji-shi, Tokyo, and Yutaka Ishizaka, 1-11-7, Shinmachi, Setagaya-ku, Tokyo, all of Japan

Continuation of Ser. No. 38,186, Apr. 14, 1987, abandoned, which is a division of Ser. No. 664,828, Oct. 25, 1984, Pat. No. 4,679,935. This application Nov. 9, 1988, Ser. No. 270,430

Claims priority, application Japan, Oct. 28, 1983, 58-201964; Jan. 27, 1984, 59-11894; Aug. 30, 1984, 59-179443

Int. Cl.[4] G01J *1/00*

U.S. Cl. 356—121 **4 Claims**



1. An apparatus for determining a projection direction of a light beam emitted from a light source, comprising:

at least four photoelectric means for converting light received to an electric signal, including a first and a second photoelectric means spaced apart vertically and a third and a fourth photoelectric means spaced apart horizontally;

holding means for holding each of said photoelectric means individually moveable in a first direction and a second direction normal to said first direction, said first and second directions defining a plane generally perpendicular to the projecting direction of said light beam;

first indicating means electrically connectable to said first and second photoelectric means for indicating electrical signal output from said first and second photoelectric means;

second indicating means electrically connectable to said third and fourth electrical signal output for indicating electrical signal output from said third and fourth photoelectric means; and

position indicating means operatively connected to said holding means for indicating a predetermined position of a light pattern of said light beam, the indication of said position indicating means indicating the projecting direction of said light beam;

wherein said four photoelectric means are each moveable relative to each other in said first and second direction when said projecting direction is being indicated.

4,907,878

DEVICE FOR DISCRIMINATING FLUIDS HAVING DIFFERENT REFRACTIVE INDICES AND DEVICE FOR MEASURING THE VOLUMINAL FRACTION OF AT LEAST ONE FLUID OF A CURRENT OF NON-MIXIBLE FLUIDS INCORPORATING THE DISCRIMINATION DEVICE

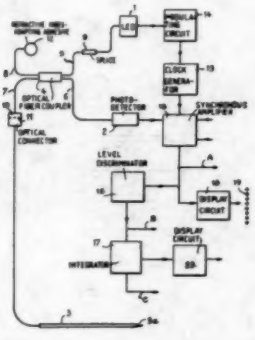
Hervé Arditty, Marly Le Roi; Gilles Le Boudec, Saint Germain en Laye; Philippe Graindorge, Magny les Hameaux; Jean-Pierre Gerardin, Nanterre; Jean-Louis Leve, Meudon, and Dominique Meyet, Paris, all of France, assignors to Electricite De France, Paris, France

Filed Nov. 25, 1986, Ser. No. 934,980

Claims priority, application France, Nov. 27, 1985, 85 17527

Int. Cl.[4] G01N *21/43*

U.S. Cl. 356—128 **13 Claims**



1. A device for discriminating fluids having different refractive indices, comprising in combination an optical fibre coupler with optical fibers having at least three ends, a semiconductor source of light combined with a circuit for modulating the intensity of said source of light and connected to one of said three ends, a semiconductor photodetector connected to another of said three ends, and an optical probe connected to a third of said three ends and comprising a multimode optical fibre which has the same refractive index profile as the fibres of the coupler and an end portion in the shape of a point; said end portion being constituted by a cone having a radius of curvature which is small enough to ensure that the forces of capillarity are insufficient to maintain a drop of liquid on said pointed

end portion when said probe is in a liquid medium and to produce a total internal reflection effect of said light at said pointed end portion when the probe is in gaseous medium.

4,907,879

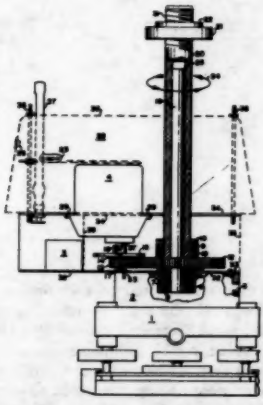
REMOTE CONTROLLED LAND SURVEYING ASSISTANCE DEVICE FOR PATH RESPONSE ALIGNMENT TO BEAM ENERGY

James B. Webb, 438 Danniel Cir., Jackson, Miss. 39212

Filed Jan. 15, 1988, Ser. No. 144,473

Int. Cl.[4] G01B *11/26*; G01C *3/08, 15/02*

U.S. Cl. 356—141 **20 Claims**



1. A land surveying assist device for providing alignment with a station, said device comprising:

reflector means adapted to reflect any energy beam to a station from which said energy beam was transmitted,

receiver means for receiving an energy signal transmitted from said station, and

means operatively associated with said receiver means for rotating said reflector means, upon receipt of said energy signal, to a position in which said reflector means is aligned with said energy beam transmitted from said station,

said energy beam and said energy signal being different from each other,

said reflected beam adapted to actuate display means in said station upon alignment of said reflected beam with said station,

said land surveying assist device not including any source of visible light for achieving alignment.

4,907,880

APPARATUS FOR DETERMINING ANGULAR DEVIATION OF AN ARTICLE

Richard G. Egan, Dover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1985, Ser. No. 770,987

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—151 **16 Claims**

1. Apparatus for determining the angular deviation with respect to a reference axis of a randomly angularly oriented article in a given plane from a desired angular orientation, said apparatus comprising:

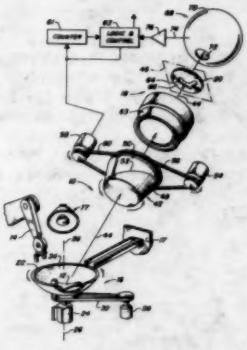
means for supporting such a randomly angularly oriented article in the given plane;

optical means for forming an image of the supported article at an image plane, said optical means having an optical axis and being mounted for rotation thereabout through a given angular displacement from a given reference location to effect a 360° rotation of said image from an initial position;

means for rotatably driving said optical means through said given angular displacement;

means responsive to rotation of said optical means for providing displacement signals indicative of the progressive cummulative change in angular displacement of said image from its said initial position;

means, including a reference pattern located in said image



plane and onto which said rotating image is projected, for providing a signal indicative of when during the course of image rotation said rotating image is in the desired orientation, said pattern being representative of the article in its desired angular orientation; and

means responsive to said displacement signals and said desired orientation signal for providing an angular deviation signal indicative of the cumulative angular displacement of said image from its said initial position at the occurrence of said desired orientation signal.

4,907,881

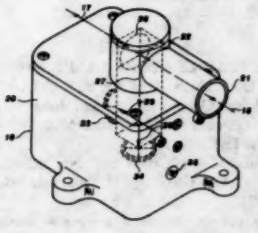
PRECISION ALIGNMENT DEVICE

Nelson E. Jones, Huntington Beach, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1988, Ser. No. 166,582

Int. Cl.[4] G01B *11/26*; G02F *1/03*

U.S. Cl. 356—152 **8 Claims**



1. In apparatus for producing a main beam along a path through an initially aligned structure for directing, collimating, focusing, reflecting, or otherwise modifying said main beam, an automatic alignment system for said structure, comprising:

laser means fixedly attached to said structure for providing a reference beam directed along a first path substantially parallel with said path of said main beam through said structure;

one or more liquid dielectric optical switches disposed in said first path of said reference beam for diverting at least a portion of said reference beam to a second path;

a plurality of quad cell detectors disposed in said second path of said reference beam for outputting electrical signals indicative of the departure of said structure from said initial alignment; and

adjustment means contacting said structure and operatively connected to said detectors for altering the position of said structure in response to said electrical signals from said detectors, to return said structure to said initial alignment.

4,907,882

SURVEYING INSTRUMENT FOR AUTOMATICALLY TAKING MEASUREMENTS

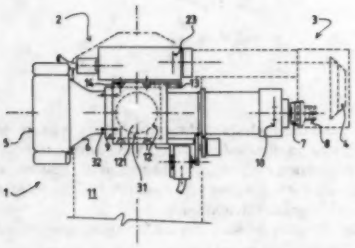
Reinhard Waibel, Berneck, and Werner Dieckow, Heerbrugg, both of Switzerland, assignors to Wild Heerbrugg AG, Heerbrugg, Switzerland

Filed Feb. 24, 1988, Ser. No. 159,860

Claims priority, application Switzerland, Mar. 2, 1987, 788/87

Int. Cl.[4] G02B *23/00*

U.S. Cl. 356—251 **20 Claims**



1. A surveying instrument with an optical component part having an exit section, said surveying instrument for imaging of a target comprising:

an objective assembly,

a camera optically coupled to said exit section of the optical component part,

an electronic circuit arrangement electrically coupled to the output of said camera,

a carrier, said carrier being placed within said optical component part in a plane in which the rear image of the target produced by the object assembly is obtained, and

a reference mark formed on said carrier and having at least one non-straight line and not intersecting the optical axis of said optical component.

4,907,883

HIGH-TEMPERATURE LASER INDUCED SPECTROSCOPY IN NUCLEAR STEAM GENERATORS

William E. Allmon, Corapolis, Pa., and John W. Berthold, Salem, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 19, 1988, Ser. No. 195,922

Int. Cl.[4] G01C *3/443*; G01N *21/63*

U.S. Cl. 356—317 **21 Claims**

1. An apparatus for conducting optical spectroscopy in a hostile environment, comprising:

a source of high intensity light;

an optical fiber connected to the source of high intensity light for transmitting light therefrom, the optical fiber having an end for discharging light onto a material to be spectroscopically analyzed;

a sheath defining a space around at least a part of the optical fiber carrying the end of the optical fiber for shielding the optical fiber from the hostile environment;

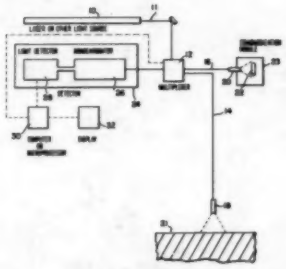
a window in the sheath for closing the space and for passing light transmitted through the end of the optical fiber out of the sheath;

light detector means for detecting and spectroscopically analyzing emitted light from the material;

an optical fiber means for transmitting the emitted light from the material to the light detector means;

a standardization module for containing a sample having a known composition and being exposed to known temperature and pressure conditions;

an additional optical fiber connected to said module for transmitting light to the sample in said module;



multiplexer means connected to said first-mentioned and additional optical fibers for switching sequentially between said optical fibers, said source of high intensity light being connected to said multiplexer means for supplying light for said optical fibers to said multiplexer means and said detector means being connected to said multiplexer means for receiving light from said multiplexer means; and

additional optical fiber means for returning light from said module to said detector through said multiplexer means.

4,907,884

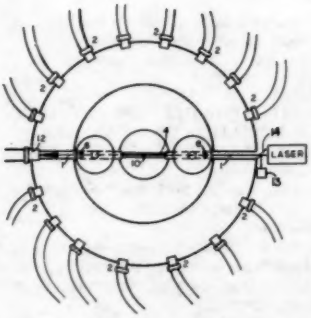
SAMPLE CELL MONITORING SYSTEM

Steven D. Phillips, Goleta; Jeffrey M. Reece, and Philip J. Wyatt, both of Santa Barbara, all of Calif., assignors to Wyatt Technology Corporation, Santa Barbara, Calif.

Continuation of Ser. No. 861,863, May 12, 1986, abandoned, which is a division of Ser. No. 671,181, Nov. 15, 1985, Pat. No. 4,616,927. This application Jun. 5, 1987, Ser. No. 59,157

Int. Cl.[4] G01N *15/02*

U.S. Cl. 356—336 **12 Claims**



1. A method for normalizing the scattered intensities of light from particles suspended in a solvent and illuminated by a collimated light beam comprising the steps of

A. Measuring the intensity of light transmitted undeviated

through the sample and external to the sample containing cell, I_s;

B. Measuring a fraction of the incident light source intensity before entering the cell, I_f;

C. Dividing all measured scattering intensities at specified scattering angles by the quantity $\sqrt{I_f I_o}$, where I_s is the intensity value measured in step A and I_f is the intensity value measured in step B.

4,907,885

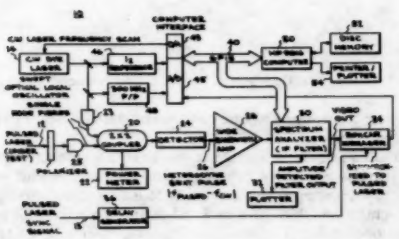
HETERODYNE LASER DIAGNOSTIC SYSTEM

Michael A. Globig, Antioch; Michael A. Johnson, Pleasanton, and Richard W. Wyeth, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 911,023, Sep. 24, 1986, Pat. No. 4,798,467. This application Jan. 17, 1989, Ser. No. 297,527

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—349 **6 Claims**



1. A laser optical spectrum analyzer comprising

a pulsed laser for generating a series of pulsed laser beams,

a continuous wave (CW) laser for generating a continuous wave (CW) laser beam,

means for measuring the average power spectrum of said series of pulsed laser beams, including means for heterodyning said series of pulsed laser beams with said CW laser beam to from a heterodyned output, including

means for detecting the heterodyned output,

means for analyzing said heterodyned output, including

means for sampling the output of said analyzing means, and

means for plotting the average frequency spectrum with respect to time of said series of pulsed laser beams.

4,907,886

METHOD AND APPARATUS FOR TWO-WAVELENGTH INTERFEROMETRY WITH OPTICAL HETERODYNE PROCESSES AND USE FOR POSITION OR RANGE FINDING

Rene Dandliker, Corcelles, Switzerland, assignor to Wild Heerburgg, AG, Herrbrugg, Switzerland

PCT No. PCT/CH88/00070, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO88/08519, PCT Pub. Date Nov. 3, 1988

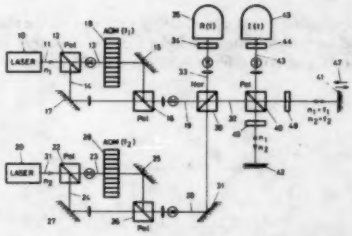
PCT Filed Mar. 30, 1988, Ser. No. 297,866

Claims priority, application Switzerland, Apr. 28, 1987, 1633/87

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—349 **22 Claims**

1. Method for measuring changes in a variable interference section of an interferometer using two-wave length interferometry and optical heterodyne processes, the method comprising the steps of splitting a first laser light beam of frequency n_1 into two cross-polarized first partial beams, subjecting one of said cross-polarized first partial beams to a frequency displacement by a frequency f_1 in order to obtain a partial beam of frequency n_1+f_1, whilst the frequency n_1 of the other of said first partial beams remains unchanged, so that a partial beam pair n_1, n_1+f_1 is formed, jointly applying the first partial beams of the partial beam pair n_1, n_1+f_1 across a Michelson interferometer and then across a polarizer to a photodetector, so that the two partial beams interfere with one another upstream of a photodetector and a beat of frequency f_1 is formed, which is detected by the photodetector, the improvement comprising the steps of splitting a second laser light beam of frequency n_2 into two cross-polarized second partial beams, subjecting one of said second partial beams to a frequency displacement by a frequency f_2, in order to obtain a partial beam of frequency n_2+f_2, whilst the frequency n_2 of the other of said second partial beams remains unchanged, so that a partial beam pair n_2, n_2+f_2 is formed, combining the first partial beams of the partial beam pair n_1, n_1+f_1 and the second partial beams of the partial beam pair n_2, n_2+f_2 and jointly applying the first and second partial beams across said Michelson interferometer and finally across the polarizer to said photodetector, so that also two second partial beams of the partial beam pair n_2, n_2+f_2 interfere with one another upstream of the photodetector, and



wherein in addition to the beat of frequency f_1, at least one beat of frequency f_2 is formed, which is detected by said photodetector, and providing a second polarizer, a second photodetector and an optical element acting as a non-polarizing half-mirror, and passing four combined partial beams prior to entry thereof into said Michelson interferometer across said optical element acting as a non-polarizing half-mirror, whereby said optical element deflects a fraction of said partial beams across said second polarizer to said second photodetector, so that the four combined partial beams interfere with one another and beats form upstream of said second photodetector, of which at least respective ones of frequencies f_1 and frequency f_2 are detected by said second photodetector, demodulating signals of the first and second photodetectors, respectively accordingly to a square of an amplitude thereof, so as to obtain in each case a demodulated signal of frequency f_1-f_2, and measuring a phase difference between two demodulated signals, said phase difference varying in a linear manner with changes of an optical path.

4,907,887

HIGH RESOLUTION INTERFEROMETER WITH HIGH ETENDUE

Donald A. Leonard, Cupertino, and Harold E. Sweeney, Menlo Park, both of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

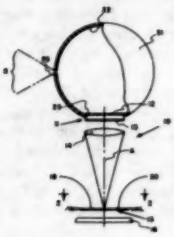
Filed Nov. 10, 1988, Ser. No. 269,816

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—352 **7 Claims**

1. In a Fabry-Perot interferometer comprising an etalon having an optical axis, a source of light on one side of said etalon and positioned to direct said light against said etalon, a lens on the side of said etalon opposite said one side and aligned with said optical axis, a mask traversing said axis at the focal plane of said lens, and optical utilizing means on the other side of said mask opposite from said lens, said mask having a light-transmitting portion adapted to pass light having a predetermined wavelength from said lens to said utilizing means, the improvement consisting of:

a container having an internal light-reflecting chamber between said source and said one side of said etalon, said container having a reflective diffuse internal surface and an entrance aperture facing said source for admitting light into said container;



said one side of said etalon being exposed to the interior of said container whereby light from said source reflected within said container is incident on said etalon.

4,907,888

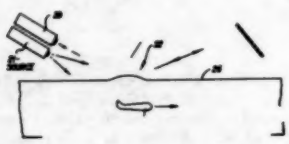
NON DESTRUCTIVE TESTING AND OTHER APPLICATIONS USING RETROREFLECTIVE ILLUMINATION

Donald A. Clarke; Rodger L. Reynolds, both of Windsor, and Timothy R. Pryor, Tecumseh, all of Canada, assignors to Diffracto Ltd., Windsor, Canada

Continuation-in-part of Ser. No. 33,930, Apr. 2, 1987, Pat. No. 4,862,268, Continuation of Ser. No. 711,646, Mar. 14, 1985, abandoned, and a continuation-in-part of Ser. No. 933,851, Nov. 24, 1986, abandoned, which is a division of Ser. No. 579,971, Feb. 14, 1984, Pat. No. 4,629,319. This application Dec. 16, 1987, Ser. No. 134,213

Int. Cl.[4] G01B *11/30*

U.S. Cl. 356—371 **3 Claims**



1. A method of detecting the presence of an object located below a surface of a liquid comprising the steps of:

moving one of the object and liquid relative to the other;

illuminating the surface with light;

retroreflecting the light from the surface back to the surface;

detecting the retroreflected light from the surface to determine the shape of the surface; and

determining the presence of a surface variation in the shape of the surface which surface variation is thus indicative of the presence of the object below the surface.

4,907,889

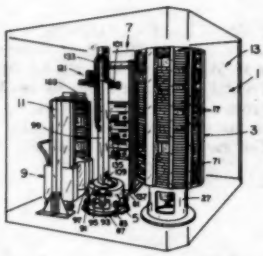
VIDEO CASSETTE LIBRARY RETRIEVAL AND SEQUENCING SYSTEM

Raymond J. Simone, St. Louis, Mo., assignor to Automation Equipment Company, St. Louis, Mo.

Filed Mar. 24, 1988, Ser. No. 172,711

Int. Cl.[4] G11B *15/68*

U.S. Cl. 360—92 **24 Claims**



1. A video cassette library, retrieval and sequencing system comprising:

at least one rotary cassette carousel containing a plurality of cassettes;

a multi-axis cassette transfer robot having a cassette transfer arm and associated pair of cassette gripper elements, each cassette gripper element being at least partially independently operable from each other and from the multi-axis robot, said pair of cassette gripper elements being angularly offset from one another and being operatively mounted on said robot by means providing rotary movement thereof along a predetermined arcuate path and further including means to facilitate cassette unloading with one of said cassette gripper elements and cassette loading with said other cassette gripper element;

at least one video cassette machine for playing cassettes inserted therein; and

control means for operating said aforementioned components to transfer cassettes from said carousel to said at least one video cassette machine through said robot and cassette transfer arm.

4,907,890

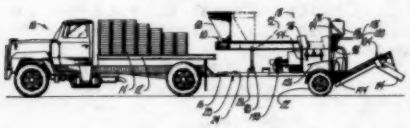
PORTABLE-CONCRETE MIXING DEVICE AND METHOD FOR USING SAME

Larry G. Lepper, Indianola, Iowa, assignor to Cemen-Tech, Inc., Indianola, Iowa

Filed May 31, 1988, Ser. No. 200,581

Int. Cl.[4] B28C *7/06, 7/12, 7/16, 5/16*

U.S. Cl. 366—27 **8 Claims**



1. A portable concrete mixing device for trailing behind a powered vehicle comprising:

a portable frame having ground engaging wheels mounted thereon and having a forward end, a rear end, and first and second opposite sides, said portable frame having hitch means at said forward end thereof for detachably connecting said frame to said powered vehicle;

first and second spaced apart hopper means on said frame adjacent said forward and rearwards ends thereof respec-

tively, each of said first and second hopper means having an open upper hopper end and an open lower hopper end;

first conveyor means on said frame having a first end adjacent and below said lower end of said first hopper means and having a second end adjacent and above said upper hopper end of said second hopper means for conveying dry concrete ingredients from said first hopper means to said second hopper means;

second conveyor means on said frame having first and second ends, said first end of said second conveyor means being below said lower hopper end of said second hopper means for receiving said concrete ingredients from said second hopper means and carrying said ingredients away from said second hopper means to said second end of said second conveyor means;

auger mixer means having an input end adjacent said second end of said second conveyor means for receiving said dry ingredients therefrom and having an output end, said auger mixer means having a rotatable auger means for continuously mixing said ingredients and for conveying said ingredients to and discharging said ingredients from said output end;

a water source on said portable frame;

water conveyor means for conveying water from said water source to said input end of said auger mixer means whereby said auger mixer means will mix said water with said dry ingredients;

a source of first admix ingredient on said portable frame;

a first admix conveyor for conveying said first admix ingredient to said input end of said auger mixer means for mixing with said water and said dry ingredients;

a source of second admix ingredient on said portable frame;

a second admix conveyor for conveying said second admix ingredient to said input end of said auger mixer means for mixing with said water and said dry ingredients.

4,907,891

FEED DEVICE FOR A CONTINUOUS FEED MIXER

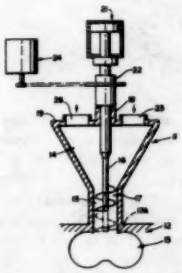
Ronald H. Pointon, Formby, United Kingdom, assignor to W & A Bates Limited, United Kingdom

Continuation of Ser. No. 66,007, Jun. 24, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 266,286

Claims priority, application United Kingdom, Jul. 4, 1986, 8616367

Int. Cl.[4] B28C *7/04*

U.S. Cl. 366—76 **3 Claims**



1. A feed device for mounting on a continuous mixer for rubber and plastics materials, the feed device comprising:

a feed reservoir;

a feed inlet passageway connecting the reservoir with the mixing chamber of said continuous mixer;

a plunger having an archimedean screw portion and being mounted for reciprocable movement within the reservoir to move material from the reservoir, through said feed inlet passageway and into said mixer so that forward movement of the plunger drives material from the feed inlet passageway into the mixer, and retraction of the plunger returns at least a portion of said archimedean screw portion into the reservoir;

and means for rotating said plunger, said means including a limited torque drive so that the plunger is rotatable during its retraction to feed material along the screw portion thereof from the reservoir into said inlet passageway during said retraction, and the plunger is both rotatable and non-rotatable during the forward movement while driving material into the mixer, said condition of rotation being controlled by the load on the plunger relative to the torque constant of the limited torque drive.

4,907,892

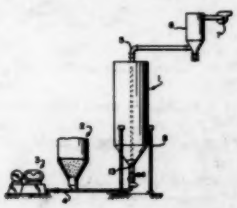
METHOD AND APPARATUS FOR FILLING, BLENDING AND WITHDRAWING SOLID PARTICULATE MATERIAL FROM A VESSEL

Kermit D. Paul, Allentown, Pa., assignor to Fuller Company, Lehigh Valley, Pa.

Filed Feb. 2, 1989, Ser. No. 305,029

Int. Cl.[4] B01F *13/02*

U.S. Cl. 366—101 **23 Claims**



1. An apparatus for blending and withdrawing solid particulate material, comprising:

a vertically oriented vessel having an upper part, a lower part and a tubular extension on said lower part;

a vertical lift column (i) centrally mounted in said vessel, (ii) having a lower part extending into said tubular extension, (iii) having an inlet within said tubular extension, and (iv) having an outlet in the upper part of said vessel;

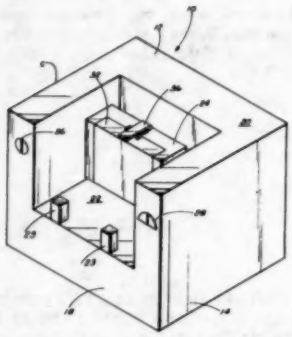
fluid supply/material drain means for (i) supplying gaseous fluid under pressure to said tubular extension below said lift column for entraining material in said tubular extension into said inlet of said lift column and upwardly of said lift column, whereby material is discharged from said outlet of said lift column in a geyser-like manner into said upper part of said vessel and (ii) withdrawing blended particulate material from said vessel, said fluid supply/-material drain means comprising nozzle means disposed within said tubular extension below said inlet of said lift column for receiving said gaseous fluid and directing said gaseous fluid toward said lift column and a first valve means in fluid communication with said tubular extension below said nozzle means for opening and closing to control withdrawal of blended particulate material from said tubular extension below said nozzle means, said first valve means when open enabling simultaneous supply of gaseous fluid and withdrawal of blended particulate material.

4,907,893

THERMO-ROTO MIXER APPARATUS

Graciela Niemeck, 5519 York, New Orleans, La. 70125, and James Borgerson, Box 708, 31 McAlister Dr., New Orleans, La. 70118-5555

Filed Oct. 31, 1988, Ser. No. 264,899
Int. Cl.[4] B01F *15/06*
U.S. Cl. 366—144 **5 Claims**



1. A thermostatically controlled blood mixer, comprising:
(a) a principal body portion;
(b) an assembly portion, for housing a plurality of test tubes containing blood specimen;
(c) heating means provided in the assembly for maintaining the blood specimens in the test tube at the desired temperature;
(d) a plurality of cradles contained within the assembly portion for accommodating each of the test tubes in each of the cradles;
(e) means for rotating the assembly portion at a predetermined speed in a tumbling fashion so that the specimens within the test tubes are gently mixed during the tumbling process; and
(f) means, including a plurality of heating elements each positioned between a pair of cradles, so that the heat from the heating elements is evenly distributed to each of the cradles for maintaining the blood in the tubes within the cradles at 37° Centigrade.

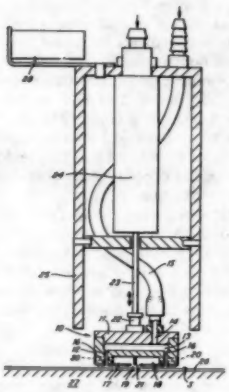
4,907,894

SURFACE-TEMPERATURE SENSING METHOD AND APPARATUS

David M. Guyoncourt, Oxfordshire, England, assignor to BNF Metals Technology Centre, Oxfordshire, England

Filed Dec. 20, 1988, Ser. No. 286,793
Int. Cl.[4] G01K *3/02, 13/04*
U.S. Cl. 374—120 **16 Claims**

1. A surface temperature sensing apparatus, comprising:
a sensing head, said sensing head having a first chamber therein;
a partition on said sensing head having opposite major surfaces, one said major surface defining a wall of said first chamber, and said partition having a central port;
a temperature sensing device disposed in said first chamber and located adjacent said central port;
a second chamber in said sensing head, said second chamber having a connection for receiving gas;
port means disposed about said first chamber, encircling said central port and connected to said second chamber for having gas supplied therefrom;
means for floatingly supporting said sensing head for maintaining said partition facing and uniformly spaced from a surface whose temperature is to be measured;
outlet port means for exhausting from said first chamber gas entering said first chamber from said central port and for producing a pressure difference between said port means and said first chamber to cause gas to flow radially inwardly from said port means, across the other of said opposite major surfaces, and through said central port into said first chamber.

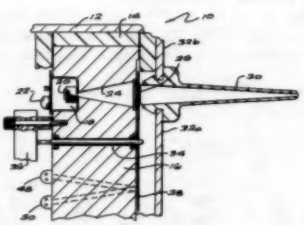


4,907,895

OPTICAL CHOPPER FOR INFRARED THERMOMETER

Charles E. Everest, Santa Ana, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Mar. 31, 1988, Ser. No. 176,170
Int. Cl.[4] G01J *5/06, 5/62*
U.S. Cl. 374—130 **38 Claims**



1. In an infrared thermometer apparatus of the type having an infrared sensor and means in said thermometer for focusing infrared radiation on said sensor, the improvement in said thermometer of an optical chopper comprising:
(a) a planar shutter having an axis of rotation, mounted for rotational movement through a plurality of stop positions adjacent and external to said means for focusing, having a first side facing said means for focusing and a second side, said shutter having equally spaced apart infrared radiation transmissive and non-transmissive portions, said non-transmissive portions of said first side having a reflective surface on at least a portion thereof; and
(b) means for rotating said shutter sequentially through said plurality of stop positions corresponding to each of said transmissive and non-transmissive portions, such that each stop position is sequentially aligned with said means for focusing for either transmitting infrared radiation through said shutter or blocking transmission of substantially all external infrared radiation to said sensors and reflecting

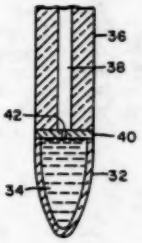
substantially all internal infrared radiation from said shutter to said sensor.

4,907,896

TEMPERATURE MEASURING DEVICE

Peter J. Martuscello, and Philip J. Rittenhouse, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Mar. 24, 1989, Ser. No. 328,456
Int. Cl.[4] G01K *5/08*
U.S. Cl. 374—190 7 Claims



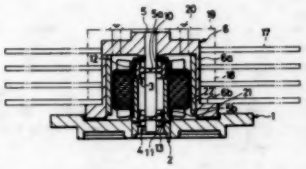
1. In a maximum reading, temperature measuring device having a bulb containing a thermally expandable liquid, and an elongated tube having a central bore into which the liquid expands when heated, the improvement comprising a flow control member of essentially uniform characteristics and positioned intermediate the tube and the bulb and sealed to each, the flow control member being a short length of tubing having a central bore opening into both the tubing and the bulb, said bore being of a controlled size that is sufficiently smaller than that of the elongated tube so that normal reverse flow of the liquid is inhibited.

4,907,897

BEARING DEVICE

Yozo Shirotori, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Oct. 22, 1987, Ser. No. 111,232
Claims priority, application Japan, Oct. 22, 1986, 86-249512
Int. Cl.[4] F16C *19/08*
U.S. Cl. 384—446 10 Claims



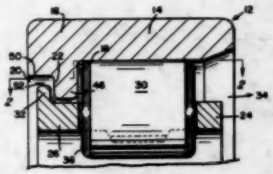
1. A bearing device comprising: a housing; a bearing holder having substantially the form of a cylindrical pipe, a lower end of said bearing holder being fitted in a central hole formed in said housing, said bearing holder being made of a magnetic material; a shaft; first and secod ball bearings fitted in said hearing holder and supporting said shaft; two yokes and a magnet held between said two yokes and fitted in an upper portion of said bearing holder; and a seal mechanism impregnated with magnetic fluid fitted between said shaft and inner peripheries of said yokes; said shaft, said bearings, and said bearing holder being made of materials which have substantially equal thermal expansion coefficients.

4,907,898

ROLLER BEARING WITH SINGLE FLANGE RACES

Thorn W. Dickinson, Berlin, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Jan. 3, 1989, Ser. No. 292,853
Int. Cl.[4] F16C *33/38, 33/58*
U.S. Cl. 384—564 4 Claims



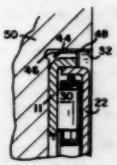
1. A bearing race and cage and roller assembly comprising: an annular race; and an annular cage and roller assembly, the annular race having an annular flange with at least one non-yielding retention member extending in one radial direction and the cage having at least one non-yielding retention member extending in the opposite radial direction, the cage retention member cooperating with the race retention member to limit axial movement of the cage in one axial direction, and the rollers cooperating with the race annular flange to limit axial movement of the cage in the other axial direction.

4,907,899

THRUST BEARING ASSEMBLY FEATURE

T. G. Rhoads, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Feb. 28, 1989, Ser. No. 316,884
Int. Cl.[4] F16C *19/30*
U.S. Cl. 384—620 7 Claims



1. For mounting in a housing having a pilot surface and an opening with a pilot surface, a thrust bearing assembly comprising:

a thrust washer having a radially-extending portion and an axially-extending annular flange, said flange having an outer peripheral edge;

a plurality of rolling elements adapted to roll along said radially-extending portion of said thrust washer;

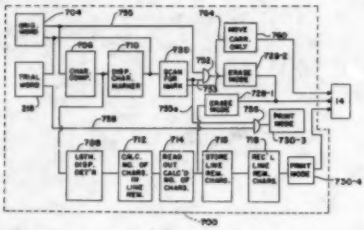
an annular band having an axially-extending annular portion adapted to engage said outer peripheral edge of said thrust washer flange; and

at least one protrusion extending generally radially-outwardly from said annular band so as to provide an interference fit between said annular band and said pilot surface of said housing, each of said at least one protrusions having a first axial edge and a second axial edge, said first edge being a leading edge having a configuration adapted to facilitate insertion of the protrusion onto said pilot surface of said housing, and said second edge being a non-leading edge having an outer diameter greater than the diameter of said housing opening so as to prevent insertion of said second edge into said housing before said first edge.

4,907,900
AUTO-REALIGNED PRINT CORRECTION

Howard C. Duncan IV, Ithaca, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.

Filed Jan. 6, 1987, Ser. No. 698
Int. Cl.[4] G06F *11/00*; G06K *3/00, 7/00*; B41J *5/30*
U.S. Cl. 400—63 12 Claims



1. In an electronic typewriter of the kind having operator input of text through a keyboard with a plurality of depressible keys, a memory, a printer for producing an output legible by the operator, the output including thereon a discrete line having an undesired word and one or more characters subsequent thereto; said memory including a correction buffer register storing in identical order corresponding data for all information appearing on the discrete line, including at least the characters of the undesired word, and the one or more characters subsequent thereto; a word list stored within the memory, controls in the typewriter for producing from the undesired word a properly-spelled trial word based on the word list, and a display presenting the trial word; the improvement combining therewith a fully automatic print correction control comprising:

(a) means activating said print correction control in response to said operator's single, momentary pressing of a particular one of the depressible keys, said pressing indicating acceptance of said trial word as replacement for said undesired word,

(b) a further register in said memory storing the characters of said trial word,

(c) means cooperating with characters stored in said registers for developing individual length information for said undesired word and for said trial word in response to activation of said print correction control,

(d) comparison means operating on said individual length information for sensing existence of a length disparity between said undesired word and said trial word,

(e) means for issuing a first electronic signal in response to sensing said existence of a length disparity,

(f) a character position counter associated with said printer, a first count in said counter defining an end-of-word position related to said undesired word, and a second count therein defining an end-of-line position related to a last of said one or more characters,

(g) calculating means generating a difference value between said first and second counts for determining the quantity of characters subsequent to said undesired word, said calculating means operating in response to issuance of said first electronic signal,

(h) means associated with said printer and said buffer register for erasing successively from said legible output said one or more characters subsequent to the undesired word, said means for erasing utilizing said corresponding data in said buffer register for control of said character selection means,

(i) means responsive to said difference value for controlling the number of erasures performed by said means for erasing,

(j) a temporary register in said memory,

(k) means for transferring said corresponding data for each character of said one or more characters from said buffer register into said temporary register simultaneously with erasure of said each character from said legible output by said means for erasing,

(l) means for issuing a second electronic signal in response to performing said number of erasures,

(m) amending means activated automatically in response to said second signal, said amending means changing said undesired word on said legible output into conformity with characters, including blank spaces, at corresponding positions in said further register storing said trial word;

(n) means for detecting the end of the trial word in said further register,

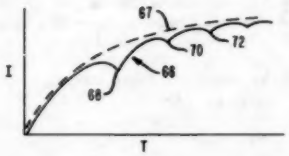
(o) means for issuing a third electronic signal in response to detecting said end of the trial word,

(p) means to recall each of said one or more characters sequentially from said temporary register and print each thereof automatically on said legible output in response to said third signal and in proper alignment with the trial word thereon.

4,907,901
METHOD AND APPARATUS FOR MEASURING DISPLACEMENT OF A MOVEABLE MEMBER OF AN ELECTROMAGNETIC DEVICE BY USING PERTURBATIONS IN THE DEVICE'S ENERGIZING CURRENT

John G. Mitchell, Trumansburg, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 24, 1986, Ser. No. 945,995
Int. Cl.[4] B41J *9/38, 11/18*; G01B *7/14*
U.S. Cl. 400—157.2 19 Claims



1. An apparatus for measuring the displacement of a movable member comprising:

an electromagnetic device having said moveable member and an associated operating coil; and

a circuit coupled to said operating coil for measuring the displacement of said moveable member when said operating coil is energized;

said operating coil having perturbations in its energizing current when said moveable member impacts against a second member during a measuring of said displacement;

said circuit comprising:

detector means for detecting said perturbations in said energizing current;

generating means for generating a first derivative signal of said perturbations in said energizing current;

said first derivative signal having indicator portions corresponding to said perturbations;

selecting means for selecting one of said indicator portions of said first derivative signal as being indicative of said displacement; and

converting means for converting said one of said indicator portions into a valve corresponding to said displacement.

4,907,902

MULTIPRINTING THERMAL TRANSFER INK RIBBON CASSETTE

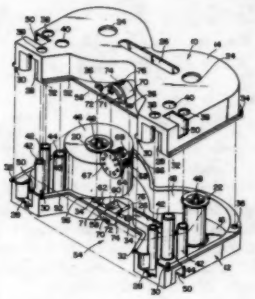
Masahiro Doi, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,720

Claims priority, application Japan, Oct. 14, 1987, 62-157312[U]

Int. Cl.[4] B41J *35/36*

U.S. Cl. 400—249 8 Claims



1. A multiprinting thermal transfer ink ribbon cassette, comprising:

a cassette case having a circumferential surface and at least one side surface;

a thermal transfer ink ribbon stored in said cassette case and subjected to a plurality of printing operations on the same surface at the same position thereof;

said multiprinting thermal transfer ink ribbon cassette being alternately loadable in a printing apparatus having a thermal head in a first loading posture and in a second loading posture which is a reversed posture with respect to the first loading posture so as to change a feed direction of said thermal transfer ink ribbon in said printing apparatus; and

count displaying means for recording a counted number of times of use of said thermal transfer ink ribbon and for displaying the counted number;

said count displaying means comprising an operation member extending out from an outer surface of said cassette case, said operation member being manipulable to increase the displayed count; and

said count displaying means further comprising a rotary member rotatably supported about a longitudinal axis thereof in said cassette case, said operation member being fixed coaxially with said rotary member so as to be rotated together with said rotary member; said operation member being exposed from at least one of said circumferential surface of said cassette case and said at least one side surface thereof; a plurality of consecutive numbers circumferentially marked on at least part of a circumferential surface and at at least part of one end face of said rotary member; openings formed in said circumferential surface of said cassette case in said at least one side surface thereof so as to correspond to at least the part of said circumferential surface of said rotary member and at least the part of said one end face thereof; and intermittent stopping means for stopping rotation of said rotary member when one of said plurality of numbers is exposed to a corresponding one of said openings.

4,907,903

REPRESENTING UTENSIL

Kiyoharu Kawashima, 5-7, Esaka-cho 5-chome, Suita-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 82,728, Aug. 7, 1987, abandoned. This application Aug. 16, 1988, Ser. No. 235,696

Int. Cl.[4] B43K *5/10;* B60D *5/00*

U.S. Cl. 401—151 1 Claim

1. Representing utensil containing a coloring assistant, in its own container, for repeatedly developing color of a depicted matter which is invisibly depicted with a coloring agent including an alkaline ph-indicator; wherein said container is provided with activated charcoal therein, and said coloring assistant consists of

4 to 20 weight % N,N-dimethylethanol amine,

0.05 to 3 weight % of citric acid,

0.05 to 3 weight % of sodium chloride, and water.

4,907,904

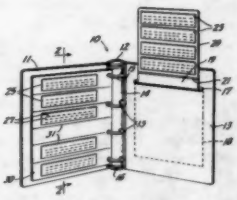
NOTEBOOK WITH SELECTIVELY CHANGEABLE, REMOVEABLE AND REPLACEABLE INFORMATION CARRIERS

Judith A. M. Baldwin, New York, N.Y., assignor to Strategic Financial Communications Corp., New York, N.Y.

Filed Jun. 14, 1988, Ser. No. 206,428

Int. Cl.[4] B42F *13/00*

U.S. Cl. 402—80 R 4 Claims



1. A personal notebook with readily selectively changeable, removable and replaceable information carriers, comprising:

(a) a plurality of notebook pages of paper having a coating with release and rebounding properties and having alignment indicia printed thereon to divide said pages into multiple label-support zones of predetermined first size and shape;

(b) a series of information carriers in the form of pressure-sensitive labels of predetermined second size smaller than said first size and of predetermined shape generally congruent with said first shape;

(c) said labels being of less than full page width and including preprinted information designations and space for inclusion by hand of further information;

(d) whereby each of said labels may be readily selectively moved and replaced to and from any of said label-support zones; and,

(e) book cover means binding said pages together.

4,907,905

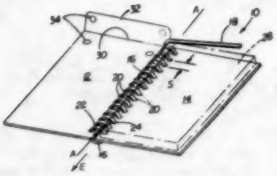
COIL-BOUND NOTEBOOK

James L. Fournier, N. Bennington, Vt., assignor to JLF Designs, Inc., N. Bennington, Vt.

Filed Oct. 5, 1988, Ser. No. 253,856

Int. Cl.[4] B42F *13/00, 13/04*; B42D *3/00*

U.S. Cl. 402—80 R **4 Claims**



1. In a coil bound notebook comprising

a helical binding coil element disposed along a coil axis and terminating in an elongated handle element extending transversely to said coil axis, and

a notebook body comprising

a first cover leaf defining a multiplicity of first binding apertures disposed along a binding edge with spacing corresponding to spacing between turns of said helical binding coil element,

a second cover leaf defining a multiplicity of second binding apertures disposed along a binding edge with spacing corresponding to spacing between turns of said helical binding coil element, and

multiple leaves having coinciding leaf binding apertures along associated edges with spacing corresponding to spacing between turns of said helical binding coil element,

turns of said helical binding coil element extending through aligned first, leaf and second binding apertures of said notebook body, in sequence, to bind said notebook,

whereby, upon rotation of said handle in a first direction, said coil is advanced along said coil axis relative to said notebook body to release said leaves, and upon rotation of said elongated handle element in a second direction, said coil is retracted along said coil axis relative to said notebook body to rebind said leaves,

the improvement wherein said first cover leaf further comprises

a flap extending generally along an edge adjoining said binding edge, said flap hinged for movement between a first position securely enclosing said elongated handle element and a second position exposing said elongated handle element for rotation of said helical binding coil element, and

means for securing said flap to said first cover leaf in said first position.

4,907,906

PIN JOINT FOR ECCENTRIC WORM PUMPS

Günther Hantschk, Waldkraiburg, Fed. Rep. of Germany, assignor to Netzsch-Mohnopumpen GmbH, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,525

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728821

Int. Cl.[4] F16D *1/12*

U.S. Cl. 403—154 **4 Claims**

1. An eccentric worm pump, comprising

a drive shaft having an axis or rotation;

a rotor arranged for rotation about an axis of rotation common to said axis of rotation for said drive shaft;

a pin joint for connecting said rotor to said drive shaft;

said pin joint including

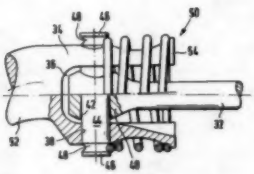
an outer joint head including a cavity which is open at least in one axial direction as well as a first diametral bore,

an innter joint head disposed in the cavity and including a second diametral bore,

a pin extending through both first and second diametral bores,

pin retaining means for locking the pin at the outer joint head,

a shoulder fixed with respect to said outer joint head,



the pin having two ends projecting radially out of the outer joint head and each end formed with a notch transversely of the longitudinal direction of the pin, and

the pin retaining means comprising a helical spring having two spring ends supported at one spring end in the two notches formed in the pin and at the other spring end on the shoulder which is not displaceable in axial direction with respect to the outer joint head.

4,907,907

LINKING DEVICE FOR A PIPE TO A STRUCTURAL COMPONENT

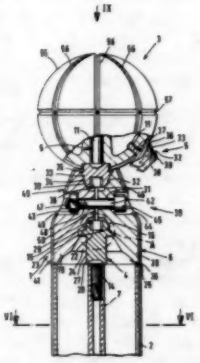
Ulrich Kreusel, Birkenstrasse 28, 6537 Gensingen, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,190

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628269; Jun. 26, 1987, 3721092

Int. Cl.[4] F16B *11/00*

U.S. Cl. 403—171 **20 Claims**



1. A linking device for connecting a pipe to a structural component, to form a junction point, comprising:

a securing element attached to said pipe and having a free end,

a connecting element attached to said structural component and having a free end, and

a single clamping device abutting with its ends on the pipe and on said structural component, said clamping device including two opposed clamping jaws which simultaneously engage said free ends of said securing element and said connecting element, thereby linking said pipe and said

structural element, said jaws held together by a screw connection.

4,907,908

ADJUSTABLE ROD JOINT

Helmut Gerhard, Siegen, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,130
Int. Cl.[4] B25G *3/36*
U.S. Cl. 403—393 7 Claims

1. Adjustable rod joint, especially for connecting rod fittings for windows, doors or the like, on which the end of one of two rods having an original width and thickness which are to be coupled with one another is provided with a U-shaped coupling shoe designed as a stamped part having legs (4) and a web section (8) and which is provided on the inside of at least one leg with fine teeth (5) formed during the fabrication, while the other rod has, at least on a narrow side intended for coupling, over a large longitudinal area complementary fine teeth with which it can be inserted between the legs of the coupling shoe, and in which the fine teeth of the coupling shoe have been formed by stamp pressing,

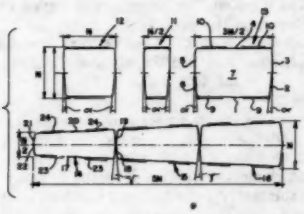
Characterized by the fact that, the coupling shoe (3) is formed by an integral portion of the rod which has been reduced in thickness (10) and correspondingly enlarged (18) in its width (13) to form lateral wings, the fine teeth (5) extend transversely over a portion of the width (14) of the reduced thickness rod section (11), corresponding to at least one lateral wing and the lateral wings (18) which project beyond the width (13) of the original rod cross-section at the reduced rod section (11) are vertically bent approximately 90° to the plane of the rod to form legs (4).

4,907,909

PAVING STONE SET

Willi Ruckstuhl, Augwilerstrasse 48, CH-8302 Kloten, Switzerland

Filed Mar. 31, 1988, Ser. No. 175,526
Claims priority, application Switzerland, Apr. 2, 1987, 1270/87
Int. Cl.[4] E01C *5/06*
U.S. Cl. 404—37 7 Claims



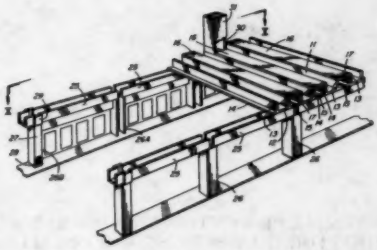
1. A paving stone set comprising at least six prefabricated pavement stones, each of said pavement stones having a flat bottom and a substantially structures top surface and, perpendicular thereto, six substantially planar, lateral boundary surfaces, four of said boundary surfaces being parallel to one of the other of said four boundary surfaces, and the remaining two boundary surfaces being opposite one another at an acute angle, at least three of said stones, when being seen in top view, each having a rectangular portion on one half and a trapezoidal portion on the other half with the lateral boundary surfaces defining two sides and a shorter base of said trapezoidal portion and, at least three further stones, when being seen in top view, each having an essentially trapezoidal portion on each half, the lateral boundary surfaces defining two sides and a shorter base of said essentially trapezoidal portions with the shorter bases being oriented opposite one another at an acute angle.

4,907,910

ROOF STRUCTURE FOR TUNNEL

William Teron, Ottawa, Canada, assignor to Teron International Development Corporation Ltd., Ottawa, Canada

Filed Mar. 28, 1988, Ser. No. 174,310
Claims priority, application Canada, Mar. 27, 1987, 533161
Int. Cl.[4] E21F *1/00*; F21D *10/04, 11/04*
U.S. Cl. 405—132 20 Claims



18. A tunnel structure comprising support structures for a tunnel roof on opposite sides of a highway passing through the tunnel, said roof being formed of a plurality of elongated parallel disposed slabs supported by the support structure and extending laterally over a highway, the slabs being spaced so as to form gaps therebetween, an elongated housing disposed over each of said gaps to form a plurality of vents above said slabs, and means communicating with said vents to exhaust air therefrom.

4,907,911

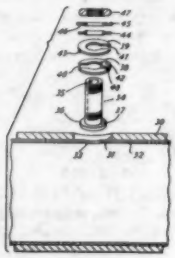
PIPELINE RENOVATION SYSTEM

Alan Rodriguez, Gressingham; John A. Rose, Giggleswick; Clifford B. Waller, and Anthony W. Doyle, both of Reading, all of England, assignors to Angus Fire Armour Limited, Lancaster, United Kingdom and Thames Water Authority, Reading, United Kingdom

Filed Apr. 27, 1988, Ser. No. 187,036
Claims priority, application United Kingdom, Apr. 27, 1987, 8709933; Aug. 19, 1987, 8719537; Aug. 19, 1987, 8719536
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—154 9 Claims

1. A method of lining an existing pipe with a permanently non-rigid liner comprising: pulling through said pipe a collapsible, flexible, permanently non-rigid, lay-flat tubular liner in a non-inflated condition, said liner having an innermost layer of impervious, elastomeric material which is compatible with the fluid to be carried by the pipe, a textile reinforcing intermediate layer, and an external protective layer of elastomeric material, said liner having an external circumference slightly less than the internal circumference of the pipe and being sufficiently flexible that pressure of said fluid in the liner after the installation thereof expands the liner into non-bonding contact

with the internal surface of the pipe the liner remaining permanently capable of resilient contraction on removal of said



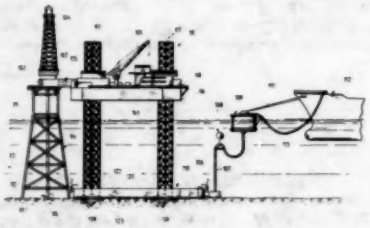
pressure, whereby the liner remains capable of being withdrawn from the pipe.

4,907,912

SUBMERSIBLE PRODUCTION STORAGE BARGE AND METHOD FOR TRANSPORTING AND INSTALLING A JACK-UP RIG IN A BODY OF WATER

Marvin L. Smith, Houston, Tex., assignor to JFP Energy, Inc., Houston, Tex.

Filed Oct. 5, 1988, Ser. No. 253,767
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—208 **16 Claims**



8. A submersible production storage barge, adapted to be transported and installed in a body of water with a jack-up rig having a hull and a plurality of jack-up legs comprising:

(a) a plurality of wall members defining at least one enclosed cavity for the storage of hydrocarbon fluids, the plurality of wall members forming an upper wall surface, a lower wall surface, and at least one side wall surface; and

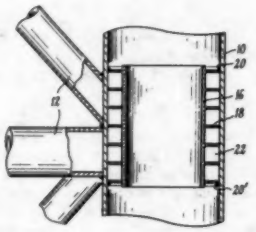
(b) means for releasably secured the plurality of wall members to the jack-up rig while the jack-up rig is being transported to a site in the body of water, whereby a jack-up rig and plurality of walls members may be transported together to the site int he body of water, the releasable securing means including a plurality of openings formed in the upper and lower wall surfaces through while the plurality of jack-up legs pass through, where the plurality of wall members may be lowered to rest upon a surface below the body of water.

4,907,913

POINT OF JUNCTION OF TUBULAR METALLIC STRUCTURES, NOTABLY FOR DERRICK PLATFORMS

Pierre Saget, La Varenne, France, assignor to Societe Francaise d'Etudes d'Installations Siderurgiques, Montreuil Cedex, France

Filed Jan. 14, 1983, Ser. No. 458,052
Claims priority, application France, Jan. 14, 1982, 82 00521
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—211 **3 Claims**



1. In a point of junction of a tubular metallic structure, particularly for derrick platforms, of the type wherein a tubular element of the structure is reinforced by welding to the exterior of said tubular element at least one tube, the improvement of means for, at the area of connection to the exterior of said tubular element of said at least one tube, stiffening and increasing the rigidity of said tubular element and thereby increasing the fatigue strength thereof, said means comprising:

a stiffening element in the form of a tubular portion having extending outwardly therefrom at least three integral annular ribs; and

said stiffening element being positioned within said tubular element in said area of connection to said exterior thereof of said at least one tube, with said tubular portion aligned coaxially of said tubular element, with said annular ribs being force fit to the interior of said tubular element to an extent to be prevented from being disconnected therefrom during use of said structure, and with axially opposite endmost of said ribs welded to said tubular element, thereby defining at least two internally sealed chambers between said stiffening element and said tubular element.

4,907,914

TETHER CONNECTOR FOR A TENSION LEG PLATFORM

Richard H. Gunderson; Terry N. Gardner, and Thomas G. A. Choate, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 48,277, May 11, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,594
Int. Cl.[4] E02D *5/74*
U.S. Cl. 405—224 **19 Claims**

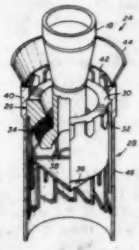
1. A connector for releasably securing a tension leg platform tether to a foundation on the ocean bottom, comprising:

a base latch element fixedly secured to said foundation, said base latch element defining a generally cylindrical recess having a substantially vertical axis, said base latch element including a plurality of shear lugs arranged in an annular array projecting radially inward a distance into said cylindrical recess, said shear lugs being spaced apart to define vertical passages between adjacent shear lugs;

a tether latch element secured to the lower end of said tether, said tether latch element having a main body sized to be received within said base latch recess, said tether latch element including a plurality of shear lugs secured to and projecting radially outward from said tether latch main body in an annular array, said tether latch shear lugs being sized and positioned to pass through said base latch

element vertical passages to a position below said base latch element shear lugs, so that said tether latch element can be lowered into said base latch element;

first turning means for automatically rotating said tether latch element in response to axial movement of said tether latch element within said base latch element so as to cause said two sets of shear lugs to come into vertical alignment, whereby said connector can be latched by lowering said tether latch element into said base latch element and then raising said tether latch element to cause said two sets of shear lugs to come into shear abutment with one another,



restraining said tether latch element from further upward displacement; and

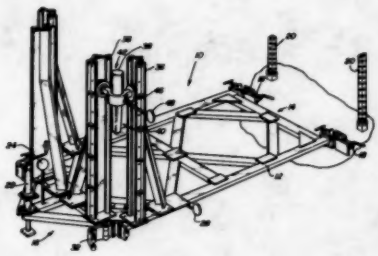
second turning means for automatically rotating said tether latch element in response to axial movement of said tether latch element within said base latch element after said two sets of shear lugs have been rotated into vertical alignment so as to cause said tether latch element shear lugs to return to alignment with said vertical channels, whereby said connector can be unlatched by lowering said tether latch element within said base latch element and then raising said tether latch element out of said base latch element.

4,907,915

TEMPLATE FOR INSTALLING PHOTOVOLTAIC PANEL ASSEMBLY AND METHOD

Robert D. Nicholson, Pemberville; Steven A. F. Kaake, Toledo, and Robert F. Smith, Walbridge, all of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Apr. 25, 1989, Ser. No. 343,051
Int. Cl.[4] E02D 5/00
U.S. Cl. 405—229 **36 Claims**



1. A portable adjustable template for use in cooperation with an impact driver for installing in the ground an array of posts of a photovoltaic panel support assembly, said template comprising:

a rigid frame to be positioned horizontally and longitudinally on the ground, said frame having a reference end and a work end;

a plurality of post guides affixed to said frame work end at predetermined locations for positioning posts to be installed and guiding them into the ground during installation;

clamping means for affixing said frame reference end to a previously installed post and aligning said frame therewith;

a plurality of guide rails affixed to said frame work end at predetermined locations, each of said guide rails cooperating with a post guide to telescopically support a post while being driven into the ground;

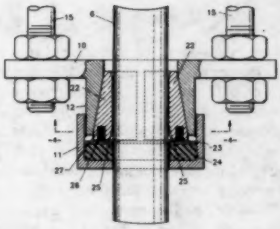
a drive chuck having an impact end for engagement with the impact driver and a driving end for engagement with a post to be installed, wherein said drive chuck is used in cooperation with a guide rail and a post guide to drive said post into the ground.

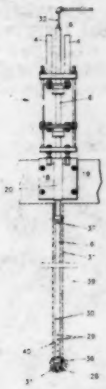
4,907,916

PRESSURE GROUTED PIER AND PIER INSERTING TOOL

Philip L. Hartman, 2757 Comstock Cir., Belmont, Calif. 94002

Filed Mar. 15, 1989, Ser. No. 324,297
Int. Cl.[4] E02D 5/62
U.S. Cl. 405—236 **12 Claims**





9. A pipe pier inserting tool comprising

(a) a supporting frame defining a pipe driving axis;

(b) means for coupling said frame to a load;

(c) means coupled to said frame for driving a pipe along said pipe driving axis;

(d) first means for coupling said pipe to said means for driving, said first means for coupling being extendably engaged with said means for driving for extension and retraction thereby, and said first means for coupling being adapted to grip said pipe when said means for driving is forced to an extended position, and to release said pipe when said means for driving is retracted; and

(e) second means for coupling said pipe to said frame.

4,907,917

METHOD OF SECURING ANCHOR RODS

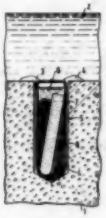
Erich Leibhard, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed Oct. 20, 1988, Ser. No. 260,232

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735592

Int. Cl.[4] E02D *5/80, 27/50;* **E21D** *20/02*

U.S. Cl. 405—261 **10 Claims**



1. A method of fastening an anchor rod in a borehole containing water by means of a hardenable bonding mass, comprising the steps of partially filling the borehole with a flowable bonding mass, inserting a closed cartridge containing a bonding mass into the borehole with the flowable bonding mass located outside the cartridge and at least partially displacing the flowable bonding mass within the borehole, and driving an anchor rod into the borehole for destroying the cartridge and mixing the flowable bonding mass and the bonding mass in the cartridge for anchoring the anchor rod in the borehole.

4,907,918

SHAKING CONTROL UNIT FOR A HYDRAULIC CYLINDER

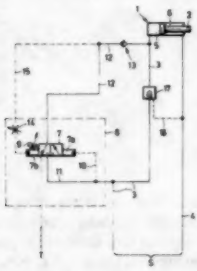
Siegmar Block, Essen, Fed. Rep. of Germany, assignor to Bochumer Eisenhütte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 95,562

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631079

Int. Cl.[4] E21D *23/26*

U.S. Cl. 405—303 **5 Claims**



1. In a shaking control unit for a hydraulic cylinder defining a piston space, wherein a first predetermined pressure is admitted to the piston space through a first hydraulic line, including a three/two-way valve having first and second control areas, and capable of assuming a zero position, a second hydraulic line being connected to the first hydraulic line, the three/two-way valve connecting the second hydraulic line to a return means, the improvement comprising:

(a) the second hydraulic line being connected to the return means by the three/two-way valve when the three/two-way valve is in the zero position, wherein the second hydraulic line is connected to the first hydraulic line over a check valve,

(b) a first control line connecting the first hydraulic line with the first control area of the three/two-way valve,

(c) a second control line connecting the second hydraulic line with the second control area of the three/two-way valve,

(d) the three/two-way valve comprising means for switching the three/two-way valve when the pressure in the first hydraulic line exceeds a second predetermined pressure which is greater than the first predetermined pressure, the three/two-way valve after switching connecting the first hydraulic line to the second hydraulic line.

4,907,919

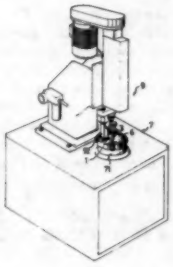
KEY MANUFACTURING MACHINE

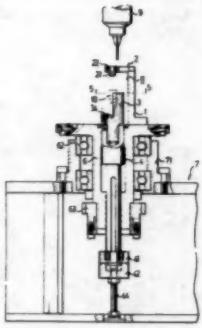
Miko Lee, No. 5, Li Hsing Lane, Chung-Cheng Rd., Hsing-chuang City, Taipei Hsien, Taiwan

Filed Dec. 8, 1988, Ser. No. 281,441

Int. Cl.[4] B23C *1/16*

U.S. Cl. 409—81 **2 Claims**





1. A key manufacturing machine utilizing a drilling means (9) adapted to facilitate drilling operations, said key manufacturing machine comprising:

a rotating means (6) having a plurality of attaching block assemblies (61) circumferentially spaced at a top portion thereof and a transmission gear (63) at a lower portion thereof, said rotating means (6) having a center-bore portion and being rotatable relative to a stationary bottom block (71) on a pair of bearings (62) disposed therebe-

tween, said block assembly (61) being sensed by a sensing device (92) for controlling a drilling depth during said drilling operation;

a base block (1) being fixedly disposed on said top portion of said rotating means (6) and being semi-cylindrically shaped to form a cavity (11) therealong;

a guiding plate (2) being attached to a top end of said base block (1) and having a pin (21) protruding downward and a plurality of longitudinal through-holes (22) disposed circumferentially thereon relative to said pin (21);

a mounting means (4) being received within said center-bore portion of said rotating means (6) to allow longitudinal movement relative to said rotating means (6) and to prevent relative rotation therebetween;

a positioning block (3) being rotatably secured on a top end of said mounting means (4) by an adjustable stud (34), an arc slot (33) being disposed on said positioning block (3) to facilitate a rotation of said positioning block (3) relative to said mounting means (4), said positioning block having a center-bored portion to form a bearing surface (31) for supporting a key and having a traverse groove (32) for positioning the key;

a pair of adjusting blocks (41, 42) being connected between a bottom end of said mounting means (4) and a guide screw (44) driven by of a gas cylinder (46) to set a height of said positioning block (3); and

a transmission means (8) being provided to engage with said transmission gear (63) on said rotating means (6) for facilitating a semi-automatic machining operation.

4,907,920

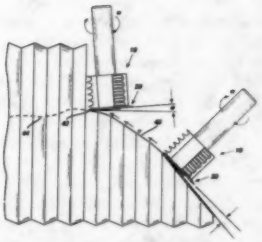
MILLING CUTTER FOR HONEYCOMB CORE MATERIAL

Wesley C. Lund, and Dan E. Pedersen, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 18, 1989, Ser. No. 298,162

Int. Cl.[4] B23P *15/28*

U.S. Cl. 409—132 **16 Claims**



1. A milling tool for cutting honeycomb core material comprising:

a shank having a first end for inserting into a chuck;

a circular saw blade rigidly fixed to said shank at a second end, said saw blade having a top surface, a bottom surface and a cutting edge, said cutting edge being a sharp edge located around a periphery of said saw blade, said top surface being beveled adjacent said saw blade cutting edge, sloping downward toward said periphery to form said sharp cutting edge; and

a plurality of circumferentially spaced cutter bodies positioned above and adjacent said saw blade top surface, each of said cutter bodies having a plurality of teeth positioned vertically above each other and extending generally horizontal and parallel with respect to each other, each of said teeth having a piercing, cutting point and a sharp cutting edge extending from said piercing cutting point at a clearance angle.

4,907,921

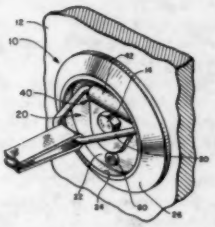
TIE-DOWN ASSEMBLY

Michael V. Akright, Lake Villa, Ill., assignor to A. L. Hansen Manufacturing Co., Gurnee, Ill.

Continuation-in-part of Ser. No. 567,627, Jan. 3, 1984, abandoned. This application May 11, 1984, Ser. No. 609,487

Int. Cl.[4] B61D *45/00*

U.S. Cl. 410—111 **30 Claims**



1. A tie-down assembly comprising:

a guard member which defines a central floor and an interior wall which cooperate to define a recess, a beveled exterior surface located outwardly from the interior wall, and a first opening in the floor;

a clamp which defines a sleeve section disposed in the recess, and a shank section which passes through the first opening in the floor;

a tie-down member pivotably mounted in the sleeve section and movable between a stowed position, in which no part of the clamp or tie-down member extends out of the recess, and a use position; and

means for defining aligned openings in the floor and the shank section, said aligned openings adapted to receive a fastener for securing the tie-down assembly to a mounting surface.

4,907,922

SELF-PLUGGING BLIND FASTENER

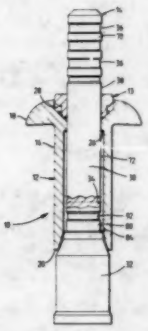
Harvey P. Jeal, Stevenage, and Frederick A. Summerlin, Holbeton, both of England, assignors to Avdel Systems Limited, Hertfordshire, England

Filed Jul. 14, 1989, Ser. No. 379,960

Claims priority, application United Kingdom, Jul. 14, 1988, 8816758

Int. Cl.[4] F16B *13/04, 13/06*

U.S. Cl. 411—43 **18 Claims**



1. A self-plugging blind fastener comprising a tubular body, an elongate stem, and an annular locking collar,

the tubular body having an elongate shank and a preformed

radially enlarged head at one end f the shank, the stem being disposed within the bore of the tubular body and having a plug part having an annular locking groove, and a tail part which projects from the head end of the body and whereby the plug part can be pulled, and moved relative to the body in the direction from the shank towards the preformed head, to cause the formation of a blind head remote from the preformed head,

the bore of the body being radially enlarged at the head end to provide an annular recess which extends peripherally of the stem and axially into the head from the head end of the body, and having a main region spaced from the head end of the body by the recess,

the recess having an outer region having a diameter substantially greater than that of the main region of the bore, and a tapered inner region in which the diameter of the recess reduces away from the outer region, to a diameter the same as that of the main region of the bore,

the fastener having means for arresting the movement of the plug part through the body in the said direction after formation of a blind head,

the annular locking collar being disposed on the projecting tail part of the stem, and having a volume smaller than the combined volumes of the recess and the locking groove, the locking collar comprising a deformable locking portion and a radially enlarged load-bearing head portion, the locking portion having a volume greater than that of the locking groove and being deformable radially inwardly, on being forced into the inner region of the recess, so as to enter the locking groove, the head portion having a volume less than that of the outer region of the recess, and an external diameter greater than that of the locking portion but such as to be capable of entering the outer region of the recess,

the stem having a collar-supporting part between the locking groove and the projecting part, the collar-supporting part fitting closely to the walls of the main region of the bore of the body and the bore of the collar, and

the angle of taper of the inner region of the recess being sufficiently great to resist, in cooperation with the collar-supporting part of the stem, the entry of at least part of the deformable locking portion into the inner region of the recess when the locking collar is subjected to a force sufficient to move the plug in the said direction while causing the formation of a blind head, but sufficiently small to allow the locking portion to enter more fully into the inner region, and to be deformed thereby when the locking collar is subjected to an increasing force after movement of the plug relative to the body has been arrested by the arresting means, the arresting means being arranged to positively arrest the movement of the plug in the said direction as soon as substantially all of the locking groove comes into register with the annular recess, and thus allow the application to the locking collar of an increasing force, whereby the locking collar can be caused to enter more fully into the recess and be deformed thereby so as to enter the locking groove.

4,907,923

CLOSET BOLT

Terence J. McGrath, Jr., R.D. 1, Box 100, Chester, N.Y. 10918

Filed Aug. 25, 1988, Ser. No. 236,595

Int. Cl.[4] F16B *27/00, 39/00*

U.S. Cl. 411—107 **11 Claims**

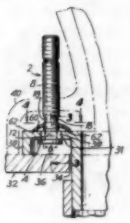
1. A closet bolt comprising:

a head;

a shank integral with the head including a first threaded fastening portion generally concentric with respect to the head; and

anti-turn protrusions extending radially outwardly from a second portion of the shank between the first threaded fastening portion and the head,

wherein the shank includes a ramped portion adjacent the shank second portion, the ramped portion having on opposite sides thereof a plurality of ramp members, said ramp members being inclined toward the bolt head.



4,907,924

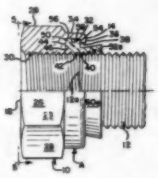
BACKWARD STARTING LOCKNUT

Keith Hellon, Libertyville, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Dec. 5, 1988, Ser. No. 280,137

Int. Cl.[4] F16B *39/34, 39/284*

U.S. Cl. 411—303 **17 Claims**



1. A backward starting locknut, comprising:

a polygonal-shaped, metal nut having a threaded axial bore extending from an end face normal thereto toward a recess formed on an opposite end; and

a locking insert of resilient plastic material having a threaded bore aligned with that of said nut and having an annular, thick wall portion mounted in said recess and an annular, thin wall portion projecting outwardly of said recess around said threaded bore;

said nut having an annular wall section defining said recess and deflected inwardly to compress said thick wall portion of said insert radially inwardly to constrict an inner portion of said threaded bore of said insert for establishing a prevailing torque when a threaded element is engaged therein.

4,907,925

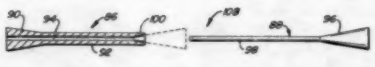
RIVET PIN

Fred Self, 933 Parkside Dr., Richmond, Calif. 94803

Continuation of Ser. No. 887,359, Jul. 21, 1986, abandoned. This application Jul. 28, 1988, Ser. No. 225,534

Int. Cl.[4] F16B *21/00, 21/18*

U.S. Cl. 411—339 **4 Claims**



1. A rivet for linking first and second members supported in spaced relationship with one another, said first and second

members including openings therethrough of substantially cylindrical configuration, comprising:

a. a substantially rigid shaft, said shaft having first and second end portions for occupying at least a part of each the openings through the first and second members;

b. a first cap having an internal bore therethrough, said first end portion of said shaft being capable of extending into said bore of said first cap causing firctional engagement between said first cap and said first end portion of said shaft, said first cap having a tapered exterior surface for frictionally engaging the opening through the first member, said internal bore of first cap extending therethrough without connection to said tapered exterior surface of said first cap; said first cap further including a hollow member attached thereto and having a bore therethrough of substantially cylindrical configuration, said shaft frictionally engaging said bore of said hollow member, said hollow member including an external surface forming a portion between the first and second members, said hollow member including an enlargement of said substantially cylindrical bore therethrough, said enlargement having a wall frictionally engaging said second cap;

c. a second cap having an internal bore therethrough, said second end portion of said shaft being capable of extending into said bore of said second cap causing frictional engagement between said second cap and said second end portion of said shaft, said second cap having a tapered exterior surface for frictionally engaging the opening through the second member, said internal bore of said second cap extending therethrough without connection to said tapered exterior surface of said first cap, said frictional engagement of said first and second caps with the first and second members and said frictional engagement of said bores of said first and second caps being of sufficient magnitude to fix said shaft between the first and second members, said first and second caps being constructed of relatively hard, rigid, material.

4,907,926

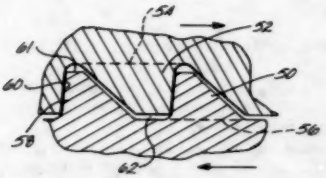
THREAD FORM AND FASTENER SYSTEM USING THE FORM

George S. Wing, 531 Esplanade, Apt. 515, Redondo Beach, Calif. 90277

Continuation of Ser. No. 702,150, Feb. 15, 1985, abandoned. This application Jul. 29, 1986, Ser. No. 892,887

Int. Cl.[4] F16B *35/00, 35/04*

U.S. Cl. 411—366 20 Claims



1. In a threaded fastener with a buttress type thread which has a load bearing flank and a non-load-bearing flank, an improvement in the thread which comprises:

(a) D_R being substantially equal to $\sqrt{0.7}\ D_c$,

(b) P being substantially equal to $1/6\ D_c$, and

(c) the load-bearing-flank being at a maximum angle of inclination of about 7° from the perpendicular to the axis of the fasteners, where

D_R=root diameter of the thread,

D_c=core diameter of the fastener, and

P=the pitch of the thread.

4,907,927

LOCKING PLATE FOR FASTENING INSULATION

Stanley W. Choiniere, Southwick, Mass., assignor to Olympic Manufacturing Group, Inc., Agawam, Mass.

Filed Oct. 26, 1988, Ser. No. 262,584

Int. Cl.[4] F16B *43/00*

U.S. Cl. 411—368 4 Claims

1. A locking plate for locking with an associated fastener having a shank and a head including a top surface comprising:

plate means comprising a plate having a planar annular top surface and a central portion recessed from said top surface and having a tapered sidewall and a bottom portion defining a central opening; and

locking grommet means comprising a locking collar and a locking receptacle for locking said fastener head to said plate means,

said locking collar defining an axial opening dimensioned to receive said fastener shank, said locking collar being insertable through said plate opening and having opposing axially spaced shoulders for retainably capturing said plate means as said collar is axially forced into said plate opening,

said locking receptacle having a top surface and a peripheral circumferential edge which engages said sidewall along a circular interface spaced from said plate bottom portion, said receptacle defining a seat axially spaced from said shoulders and comprising a locking nib axially spaced from said seat and defining a restriction having a diameter less than the corresponding diameter of the fastener head so that when said plate means is captured by said locking collar, said fastener is insertable in said grommet means and said head is engageable against said seat and lockably engageable by said locking nib to thereby lock the fastener head in axially fixed relationship with the plate means, so that said locking receptacle top surface, said plate top surface and said fastener head top surface are substantially co-planar.

4,907,928

FASTENING MEMBER FOR SECUREMENT INTO HARD MATERIALS

Josef Beck, Vaduz; Hans Hachtel, Schaanwald, and Alfred Tobler, Aachstr, all of Switzerland, assignors to Hilti Aktiengesellschaft, Fürstentum, Switzerland

Filed Nov. 14, 1988, Ser. No. 270,955

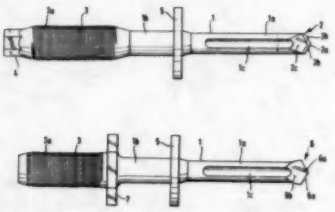
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738471

Int. Cl.[4] F16B *19/00*

U.S. Cl. 411—387 7 Claims

1. Fastening member to be driven into a hard receiving drill such as concrete, masonry, rock and the like, and having an axially extending shank with a leading end extending first into

the receiving material and an opposite trailing end comprising: a drill head at the leading end of said shank, means for securing a load to said shank located adjacent the trailing end of said shank, means on said shank spaced from the leading end thereof for engagement with a tool for rotating the fastening member, means on said shank located between the leading and trailing ends thereof for guiding said fastening member in a driving tool powered by an explosive powder charge, said shank has a first axially extending cylindrically shaped shank section extending from said drilling head toward said trailing end, a second axially extending cylindrically shaped shank section extending from said first shank section toward said trailing end, said second shank section having a greater diameter than said first shank section and, a third shank section including said means for securing a load, said third shank section located between said second shank section and said



trailing end, said drilling head has an arrowhead-like cutting edge formed of two diametrically oppositely extending cutting edge sections sloping radially outwardly from a centered tip in the direction toward the trailing end of said shank, said means for engagement with a tool comprises a polygonally shaped projection located on said shank between said second shank section and the trailing end thereof, said projection being polygonally shaped transverse to the axial direction of said shank, and said means for guiding said fastening member comprises a disk frictionally locked on said second shank section and projecting radially outwardly from said second shank section, said disk being displaceable on said second shank section toward said trailing end when said fastening member is driven by an explosive powder charge, and means on said first shank section for evacuating material drilled by said drilling head.

4,907,929

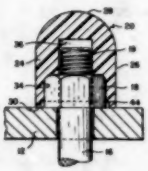
BOLT AND NUT COVER

Raymond B. Johnston Jr., 136 Bellwood Ct., Mars, Pa. 16046

Filed Nov. 25, 1986, Ser. No. 934,764

Int. Cl.[4] F16B *37/14*

U.S. Cl. 411—431 **19 Claims**



1. A cover for the end of a threaded bolt which extends through a nut by a predetermined distance comprising:

(a) a noncollapsible body member having a first open end which is normal to the axis of said bolt, said body comprising an outer shape in the form of a cylinder extending axially from said first end and to which there is formed a coaxial convex hemispherical surface, said body having an internal cavity extending longitudinally into said body from said first end, said cavity comprising:

(i) a first section coaxial with said bolt and of the diametrical shape of said nut and terminating in said first end; and

(ii) a second cylindrical section coaxial with said bolt and adjacent and open to said first section, said second section being of an axial depth greater than or equal to said predetermined distance and of a diameter less than the outer thread diameter of said bolt and configured to allow the threads of said bolt extending from said nut to engage the inner surface of said second cylindrical section, the inner surface of said second cylindrical section being formed from a flexible material, said first section being effective to engage said nut to prevent the rotation of said cover when said cover is applied to said bolt and said nut and said second section being effective to engage the extended portion of said bolt to prevent the axial removal of said cover from said bolt when said cover is applied to said bolt and said nut.

4,907,930

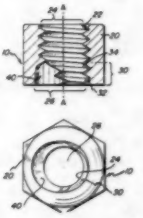
ANTI CROSS THREAD NUT

Francis C. Peterson, Woodbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Aug. 10, 1988, Ser. No. 230,589

Int. Cl.[4] F16B *37/16*

U.S. Cl. 411—437 **15 Claims**



1. An anti cross threading female threaded fastener, comprising:

a body having a threaded bore therein, said bore having a central axis and at least one open end for receiving a threaded male fastener; and

an unthreaded lip section formed in said at least one open end, said lip section being offset from the central axis of said bore;

at least one partial thread formed in said bore opposite said lip section;

said at least one partial thread comprising between about 20 to about 70 percent of the diameter of said bore;

wherein said lip section and said at least one partial thread coact to guide a threaded male fastener such that threads on said male fastener are in phase with said thread in said bore,

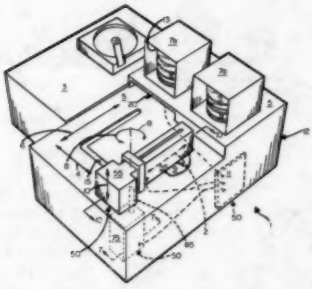
the thread in said bore extending from said lip section through to the other end of said body, whereby cross threading of said male fastener and female fastener is minimized.

4,907,931

APPARATUS FOR HANDLING SEMICONDUCTOR WAFERS

Chester L. Mallory, Campbell; Edric H. Tong, Santa Cruz, and Wayne K. Borglum, San Jose, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Filed May 18, 1988, Ser. No. 195,703
Int. Cl.[4] B65H 5/00
U.S. Cl. 414—225 32 Claims



1. A semiconductor wafer handling apparatus for automated movement of semiconductor wafers between wafer cassette trays and wafer test systems, said assembly comprising:

a platform for carrying at least one semiconductor wafer cassette tray;

wafer alignment means carried by said platform for aligning a semiconductor wafer in a predetermined test position, said alignment means including:

wafer stage means for carrying said wafer to be aligned;

wafer stage drive means coupled to said stage means for moving said stage means orthogonally to an aligned, central position beneath the major surface of said wafer;

wafer support means coupled to said stage drive means for supporting said wafer above said stage means when said stage means moves to said aligned, central position; and

sensor means associated with said stage drive means for sensing when said wafer is in said aligned, central position;

wafer transfer means associated with said platform and said wafer alignment means for transferring said wafer between said cassette tray, said alignment means and said test system;

said wafer transfer means being operational in the same plane relative to said platform and capable of extending, retracting and rotating in said plane;

said wafer transfer means including:

a shuttle arm assembly mounted for translational and rotational movement so that said shuttle arm assembly may be selectively aligned with said cassette tray, said alignment means and said test system;

means for controlling said translational and rotational movement of said shuttle arm assembly for selectively extending, retracting and rotating said shuttle arm assembly relative to each of said cassette tray, said alignment means and said test system so that in response to signals from said control means said shuttle arm assembly can be selectively actuated to translate to a cassette tray position and secure and remove a semiconductor wafer from said cassette tray, translate to a wafer alignment position and insert, release, secure and remove said wafer from said alignment means, and

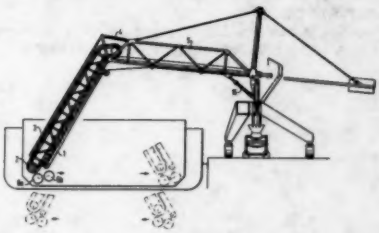
translate and rotate to a wafer test position and place said wafer on, release, secure, and lift said wafer off said test system.

4,907,932

CONTINUOUS BULK MATERIAL CONVEYOR

Hartmut Grathoff, Wendelstein, Fed. Rep. of Germany, assignor to Man Gutehoffnungshütte GmbH, Oberhausen, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 303,546
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802420
Int. Cl.[4] B65G 67/60
U.S. Cl. 414—140.9 4 Claims



1. In a movable continuous conveyer for removing bulk material especially for unloading ships, including a boom that has a conveyer belt, is pivotably connected to a movable support structure, and is adjustable in height via a luffing mechanism in the form of a first linear drive, also including a steep-rise conveyer system with a conveyer belt for unloading bulk material that is suspended on the free end of said boom, is pivotable in a vertical plane via a second linear drive about a horizontal axis, and has a cover belt conveyer, the end regions of the belts of the steep-rise conveyer system are guided about guide means, further including a material-receiving part for a receiving region of said steep-rise conveyer system, with said material-receiving part including two casting reels that can be driven in opposite directions and are mounted in a support structure, the improvement wherein:

said support structure for said casting reels includes three control linkage groupings, a first one of which serves for an articulated interconnection of said casting reels, and the other two of which serve for an articulated connection of said casting reels with shafts of adjacent lower ones of said guide means for said belts of said steep-rise conveyer system;

one of said shafts of said lower guide means is adapted to be shiftable in height in further guide means via a third linear drive;

a fourth linear drive is provided for adjustment of the quadrilateral articulation defined by said three control linkage groupings and said shafts of said lower guide means for said belts of said steep-rise conveyer system;

during a pendulum movement of said steep-rise conveyer system transversely through, for example, the hold of a ship, a respectively leading one of said casting reels is disposed higher than the other casting reel such that both casting reels pick up at least nearly the same amount of material;

a first control mechanism is provided for adjusting said second linear drive of said luffing mechanism, as a function of deflection of said steep-rise conveyer system out of a vertical position, in such a way that the course of movement of said casting reels across said bulk material is horizontal; and

a second control mechanism is provided for adjusting said third and fourth linear drives for adjusting said quadrilateral articulation and for shifting the height of the leading casting reel, as a function of deflection of said steep-rise conveyer system out of a vertical position, in such a way that during said pendulum movement of said steep-rise conveyer system, said casting reels always assume the

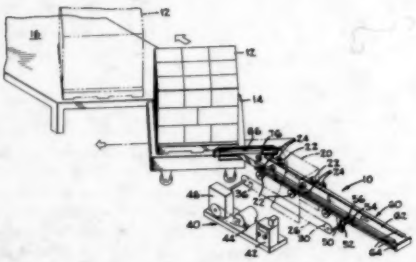
same position relative, for example, to said ship, and a stream of bulk material picked up by said casting reels is always directed at least nearly perpendicular to said first one of said three control linkage groupings that interconnects said casting reels and is directed into said receiving region of said steep-rise conveyer system.

4,907,933

PALLET UNLOADER

Richard H. Kressly, Red Hill; Greogry B. Dale, Warrington, and William J. Plant, Hatfield, all of Pa., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 232,076, Aug. 15, 1988, abandoned.
This application Jul. 31, 1989, Ser. No. 388,721
Int. Cl.[4] B65G *67/24*
U.S. Cl. 414—334 **5 Claims**



1. Apparatus for transferring a palletized load from a moving load supporting vehicle as said load supporting vehicle moves through an unloading station, said palletized load moving with said load supporting vehicle comprising:

a load receiving station for receiving said palletized load from said moving load supported vehicle;

an unloader ram having a leading edge for contacting said palletized load, said unloader ram mounted for extension along a predetermined path;

drive means for driving said unloader ram along said predetermined path;

actuator means responsive to the position of said load supporting vehicle relative to said unloading station for actuation of said drive means urging said unloader ram to discharge said palletized load from said moving load supporting vehicle while said palletized load continues to move with said moving load supporting vehicle to said load receiving station without relative motion between said palletized load and said leading edge of said unloader ram.

4,907,934

VARIABLE RATE BOAT LOADER

Brice R. Holladay, 9732 S.W. Siuslaw, Tualatin, Oreg. 97062

Filed Dec. 21, 1988, Ser. No. 288,075
Int. Cl.[4] B60P *3/10*
U.S. Cl. 414—462 **14 Claims**

1. A boat loader/carrier for loading a boat onto a top of a vehicle, wherein the boat in its unloaded initial position has a first end thereof located at a distance spaced apart from an end of the vehicle and a second end thereof located adjacent the end of the vehicle, the boat having a center of gravity positioned between the first and second ends, the loader/carrier comprising:

a continuous winch line;

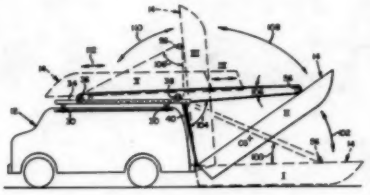
winch means mounted atop the vehicle for pulling in the winch line;

pulley means attached to the boat at a point between the first end of the boat and the center of gravity thereof for engaging a first bite of the winch line;

a winch line connector mounted at the second end of the boat for detachably connecting the winch line thereto; and

support means mounted atop the vehicle at the end thereof for supporting a second bite of a winch line; and

the winch line extending continuously from the winch means atop of the vehicle lengthwise of the boat through the pulley means and back to the support means and



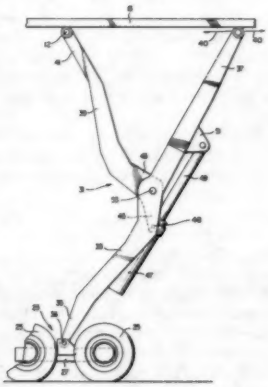
thence to the winch line connector at the second end of the boat, such that operation of the winch means to pull in the winch line raises the first end of the boat toward the end of the vehicle with a doubled mechanical advantage until the pulleys rise above the elevation of the support means and thereafter raises the first end at reduced mechanical advantage less than the doubled mechanical advantage.

4,907,935

CARGO TRANSPORTER

Harry S. Mankey, Dallas, Tex., assignor to Standard Manufacturing Company, Inc., Dallas, Tex.

Filed Dec. 4, 1987, Ser. No. 128,781
Int. Cl.[4] B64C *1/22*
U.S. Cl. 414—495 **11 Claims**



1. A cargo transporter comprising:

a frame;

a cargo platform mounted on the frame;

front and rear wheel assemblies;

rigid front and rear legs having upper ends that support the frame and lower ends that are connected to the wheel assemblies;

a plurality of support arms, each of which has an upper end pivotally connected to the frame and a lower end, there being a pivotal connection between each leg and a corresponding arm intermediate the said arm upper and lower ends to form front and rear lift assemblies, the lower end

of said arm extending beyond said pivot connection in an angled direction so as to form a bellcrank configuration; and

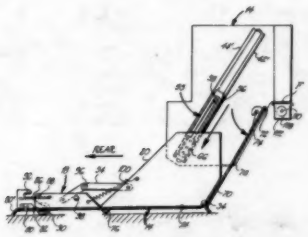
means coupled between each leg and connecting support arm extension for independently and selectively changing the angles between the legs and the corresponding support arms of the front and rear lift assemblies to cause the frame and the cargo platform to move vertically.

4,907,936

WHEELCHAIR LIFT FOR VEHICLES

Fernand J. Bourdage, Nepean, Canada, assignor to Joyride Company, Ontario, Canada

Filed Aug. 18, 1988, Ser. No. 234,211
Int. Cl.[4] B60P *1/44*
U.S. Cl. 414—545 **13 Claims**



1. A wheelchair lift for a van adapted to be installed into, and operate within, a recess formed into the rear end of the horizontal van floor, said recess having opposing side and front margins and being open at the rear thereof, said lift comprising:

a pair of parallel spaced apart elongated guide rails, each said guide rail securely connected against one said recess side;

each said guide rail lying in a vertical, longitudinally disposed plane and disposed diagonally downward toward the rear of the van;

a platform having a horizontally disposed bed and upwardly extending side structure and adapted to receive a wheelchair or the like atop said bed;

said platform having an upper position wherein said bed is aligned with the van floor and a lower position wherein said bed is atop the ground;

said platform also having a main transverse axis horizontally disposed above said bed and passing through the rotational axis of a sprocket coaxially mounted for rotation on each said side structure;

a pair of spaced apart rollers mounted for rotation on each said side structure adjacent each said sprocket, each said roller adapted to rollably translate within the corresponding said guide rail;

each said roller pair adapted to interengage within the corresponding said guide rail to maintain said bed horizontal as said platform is raised and lowered between its upper and lower positions;

a length of drive chain fixed at its first end adjacent the upper end of said guide rail, each said drive chain extending from said fixed end downwardly along each said guide rail around said sprocket and back upwardly along each said guide rail to engage a drive means connected to the van floor and operably connected to each said drive chain;

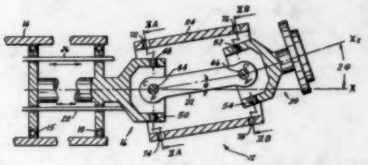
each said drive means for controlledly extending and retracting each said drive chain adjacent its second end whereby the corresponding said sprocket is lowered and raised, respectively, along the corresponding said guide rail.

4,907,937

NON-SINGULAR INDUSTRIAL ROBOT WRIST

Veljko Milenkovic, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 8, 1985, Ser. No. 752,753
Int. Cl.[4] B25J *17/00*
U.S. Cl. 414—735 **18 Claims**



1. A wrist for an arm comprising:

a first link;

an end link;

a rod connecting the first link and end link, a first center and a second center spaced apart on the rod;

a connecting tube;

first gimbal means for connecting the rod and the first link for rotation about a first pair of perpendicular axes that intersect at the first center;

second gimbal means concentric with the first center for connecting the tube and the first link;

third gimbal means for connecting the rod and the end link for rotation about a second pair of perpendicular axes that intersect at the second center;

fourth gimbal means concentric with the second center for connecting the tube and the end link;

first means for substantially equalizing the amount of rotation of the first link about a first axis of the first pair of axes at the first center, and the amount of rotation of the end link about a first axis of the second pair of axes at the second center; and

second means for substantially equalizing the amount of rotation of the first link about the second axis of the first pair of axes at the first center and the amount of rotation of the end link about the second axis of the second pair of axes at the second center.

4,907,938

LOADING APPARATUS FOR A PLATEN PRESS USED IN MAKING PARTICLE BOARD

Jürgen Pesch, and König, both of Krefeld, Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 67,967, Jun. 29, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 339,970
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622665
Int. Cl.[4] B27N *3/22*
U.S. Cl. 414—749 **3 Claims**

1. A loading apparatus for a platen press for making particleboard from mats, comprising:

a loading frame disposed adjacent said platen press;

a recycling funnel disposed upstream of said loading frame for receiving mats;

a belt tray on said loading frame displaceable between a mat-receiving position within said frame and a mat depositing position wherein said belt tray extends from said frame into said press, said belt tray comprising:

a shaft;

a drum rotatable with said shaft,

a discharge lip spaced from said drum, and

a belt passing around said drum and said lip for receiving said mat;

a belt drive on said frame selectively engageable with said shaft in said receiving position of said belt tray for rotating

said shaft and displacing said belt to advance a mat onto said belt tray and, selectively, upon the development of a defect, for reversing the displacement of said belt to deposit a mat on said belt into said funnel;

a tray drive comprising:

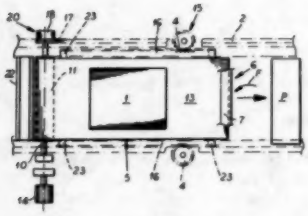
a rack fixed on said belt tray, and

a pinion on said frame engaging said belt tray rack and rotatable to displace said tray between said positions;

a delivery drive including:

a rack fixed on said frame, and

a pinion engaging said frame rack and rotatable on said shaft and, upon coupling to said shaft, rotating said



drum and displacing said belt as said tray is retracted from said press to deliver a mat on said belt into said press; and

an electromagnetic clutch having one clutch half nonrotatably connected to said pinion on said shaft and another clutch half connected to said shaft and selectively engageable to couple said clutch halves to displace said belt as said tray is retracted, for delivery of a mat to said press, and disengageable to enable said tray to retract without belt displacement and a mat on said belt to be returned from said press to said frame for deposit in said funnel by said belt drive.

4,907,939

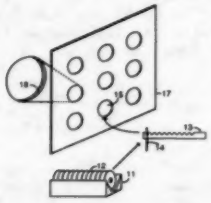
TRANSFER METHOD USING WALKING BEAM GRIPPER

Richard J. Carlton, Santa Clara, Calif., assignor to Phase 2 Automation, Sunnyvale, Calif.

Division of Ser. No. 113,978, Oct. 29, 1987, Pat. No. 4,865,509. This application Feb. 9, 1989, Ser. No. 308,274

Int. Cl.[4] B65G *69/00*

U.S. Cl. 414—786 **4 Claims**



1. A method for transferring a plurality of annular disks, by way of cantilever means having a free end and a fixed end, from a cassette to a planar pallet having a plurality of apertures, each for containing a single disk,

loading said plurality of disks from said cassette onto said cantilever means by inserting said cantilever through the holes in the middle of said annular disks;

transporting said disks on said cantilever means to said pallet;

unloading a first disk from the free end of said cantilever means into one of said apertures in said pallet;

advancing the remaining disks to the free end of said cantilever means by a walking beam motion; and

unloading the next disk from the free end of said cantilever means into another aperture in said pallet.

4,907,940

CROSS-CUTTING SAW

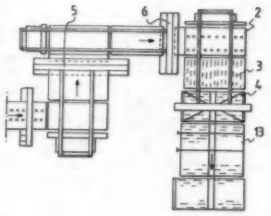
Per A. Jantinen, Helsinki, Finland, assignor to Oy Raumatic AB, Nastola, Finland

Filed Nov. 9, 1987, Ser. No. 118,223

Claims priority, application Finland, Oct. 7, 1987, 874411

Int. Cl.[4] B65G *57/03*

U.S. Cl. 414—789.6 **2 Claims**



1. A conveying and stacking assembly comprising:

a receiving table for receiving cut-off sheet packages;

a spacer strip table located downstream of said receiving table;

a lifting table of a stacking station located downstream of said spacer strip table on which cut-off sheet packages are stacked for transport;

longitudinal pusher means disposed adjacent to said receiving table and adapted to be moved behind the cut-off sheet packages for pushing the cut-off sheet packages to the desired, programmed point on said receiving table;

transverse pusher means disposed adjacent to said receiving table for pushing the cut-off sheet packages from said receiving table to said spacer strip table;

said receiving table being movable at least in the direction of movement of the sheet packages such a distance that said longitudinal pusher means can be placed behind the sheet packages; and

wherein said spacer strip table comprises spacer strips programmably attached to a spacer strip carriage such that only those spacer strips which enter underneath the sheet packages that have been moved onto said spacer strip table move along with said spacer strip table onto said lifting table or upon the sheet stacks already resting thereon.

4,907,941

APPARATUS FOR FEEDING BLANKS TO A PACKAGING MACHINE

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,164

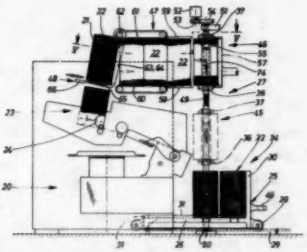
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627868

Int. Cl.[4] B65H *1/26, 1/30*

U.S. Cl. 414—795.8 **10 Claims**

6. Apparatus for feeding blanks to a packaging machine for the production of hinge-lid cigarette packs, the blanks produced elsewhere being fed as a blank stack to a blank magazine located at the machine, and individual blanks for prouducing the packs being extracted from the magazine, characterized in

that, at any particular time, several blank stacks (22) can be advanced to the packaging machine (20) on a transportable stack pallet (25) and can be successively extracted from the stack pallet (25) and fed to the blank magazine (23) by means of at least one fixed stack conveyor (27) assigned to the packaging machine (20); characterized in that, for the picking up of a blank stack (22) from the stack pallet (25), the stack conveyor



(27) has an elevator (45) with a stack pick-up in the form of lower and upper clamping jaws (36, 37) between which the blank stack (22) is received; and that at least one cross-conveyor (47, 68) extends above the packaging machine (20) and consists of upper and lower conveyor belts (60, 61), for transporting the blank stack (22) from the elevator to the working side of the packaging machine (20).

4,907,942

ARRANGEMENT FOR SEPARATING PAPER SHEET PADS FROM A STACK

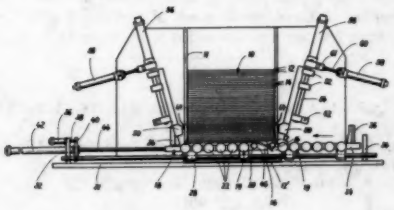
Dieter Pfeil, Leingarten, Fed. Rep. of Germany, assignor to Schneider GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Aug. 17, 1987, Ser. No. 86,571

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629491

Int. Cl.[4] B65G *59/06*

U.S. Cl. 414—798 **19 Claims**



1. An arrangement for individualizing non-glued paper pads having cardboard backs from a stack which includes a plurality of cut paper layers and intermediate cardboard end sheets, comprising

a machine frame and chute which receives the stack, is open in the downward direction, and is delimited by vertical delimiting surfaces;

a support adapted to be positioned against one end of the stack which is covered by a respective cardboard end sheet in such a manner that a part of the stack projects freely beyond an edge of said support;

at least one individualizing head periodically movable at a region of the stack that projects beyond said edge of said support against a vertical cut surface of the stack to bend the paper of the stack inclinedly toward said support, all the way to an end position in which only the last one of the paper layers and the cardboard end sheet associated therewith are still bent away from the remainder of the stack, while the remaining paper layers up to the last one of the intermediate cardboard end sheets are flipped back to the remainder of the stack owing to their elastic restoration forces, thus forming a gap in the stack, and wherein said support includes a carriage which is horizontally movable to and fro on said machine frame underneath said chute and includes support rollers for the stack and means for peeling off the paper pads that have been bent away by said individualizing head; and

means for separating the respective paper pad that had been bent away from the remainder of the stack by said individualizing head from the stack.

4,907,943

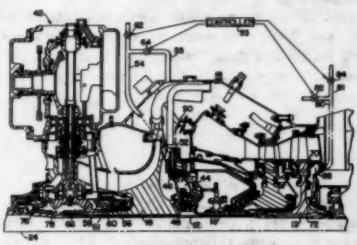
METHOD AND APPARATUS FOR ASSESSING THRUST LOADS ON ENGINE BEARINGS

George W. Kelch, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1988, Ser. No. 198,330

Int. Cl.[4] F02C *7/00*

U.S. Cl. 415—1 **3 Claims**



1. In an operating gas turbine engine having a rotor located by an axial bearing having first and second races, said rotor being displaceable relative to said bearing in accordance with an applied load along a longitudinal axis from said first race to said second race with a null position of zero load therebetween, and further having a selectively pressurized axial trim cavity capable of generating said axial bearing loads in accordance with the magnitude of pressure therein, a method for determining a value of null position trim cavity pressure, said method comprising the steps of:

varying the pressure in said axial trim cavity between low and high values;

measuring the axial position of said rotor within the bearing for each of said trim cavity pressure values;

determining from said measured rotor position values those values indicative of a shift in rotor position from said first race to said second race corresponding to said null position value of zero load; and

determining from said measured null position value a corresponding value of trim cavity pressure.

4,907,944

TURBOMACHINERY BLADE MOUNTING ARRANGEMENT

Gerard P. Kroger, Cincinnati; Robert A. Peck, Loveland, and Ralph A. Kirkpatrick, Mason, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 1, 1984, Ser. No. 655,792

Int. Cl.[4] F01D *1/26*

U.S. Cl. 415—65 **13 Claims**

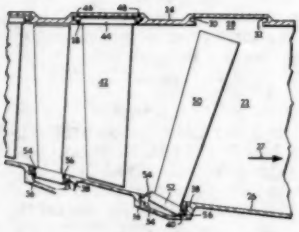
1. In a turbomachine with an annular flowpath radially bounded by first and second concentric casings, an improvement comprising:

a one-piece first casing having at least one circumferential

recess disposed in a surface facing said flowpath, each recess including axially opposite circumferential slots;

a plurality of first blades, each with axially facing tangs on a mounting platform adapted to mate with said slots in said first casing recess;

a one-piece second casing having at least one circumferential recess disposed in a surface facing said flowpath, each



recess having a plurality of second blades mounted therein; and

wherein said mounting platform of a first blade is assembled into said first casing recess by inserting said platform into said recess and then twisting said blade and platform so that said tangs mate with said slots of said first casing recess.

4,907,945

SIDE-CHANNEL COMPRESSOR

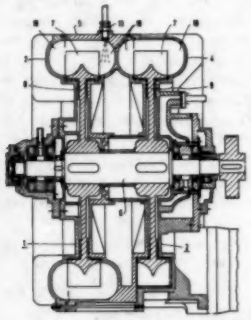
Siegfried Schoenwald, Bad Neustadt/S, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 338,971

Claims priority, application Fed. Rep. of Germany, May 30, 1988, 8807064[U]

Int. Cl.[4] F01D *5/08*

U.S. Cl. 415—117 **12 Claims**



1. A side-channel compressor comprising:

(a) a housing;

(b) a rotor, disposed in said housing;

(c) transport blades included on said rotor, said housing having a side-channel space free of said transport blades;

(d) an injection nozzle introducing a cooling liquid into the transport section of the compressor, wherein said injection nozzle is disposed on a portion of said housing and wherein the injection nozzle directs a coolant into said side channel space.

4,907,946

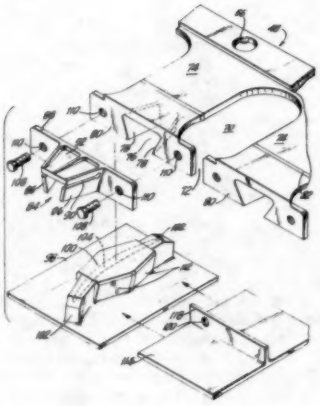
RESILIENTLY MOUNTED OUTLET GUIDE VANE

John J. Ciokajlo, Cincinnati, Ohio, and Daniel S. Vogt, Elsmere, Ky., assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 10, 1988, Ser. No. 230,392

Int. Cl.[4] F04D *29/64*

U.S. Cl. 415—209.3 **38 Claims**



1. A mounting assembly for resiliently mounting a plurality of outlet guide vanes within the flowpath of a turbine engine, comprising:

an inner support member for supporting inner radial end portions of said outlet guide vanes within said flowpath;

an outer support member arranged around said inner annular support member for supporting outer radial end portions of said outlet guide vanes within said flowpath; and

a plurality of resilient support means operatively associated with one of said inner and outer support members and wherein each of said resilient support means supports a corresponding one of said guide vanes and is used for controlling and limiting compressive thermal stresses applied to corresponding one of said outlet guide vanes during operation and shut down of said turbine engine.

4,907,947

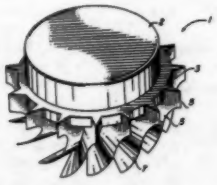
HEAT TREATMENT FOR DUAL ALLOY TURBINE WHEELS

George S. Hoppin, III, Scottsdale, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Filed Jul. 29, 1988, Ser. No. 226,322

Int. Cl.[4] F01D *5/34*

U.S. Cl. 416—241 R **10 Claims**



8. A dual alloy turbine rotor comprising a hub portion composed of a first nickel base superalloy composition having high tensile strength at elevated temperatures,

a blade portion composed of a second nickel base superalloy

composition having high creep-rupture strength at elevated temperatures,

said hub portion being metallurgically bonded to said blade portion to form a unitary rotor, and

said rotor being heat treated after bonding by solutionizing at about 2040° F. and double aging, first at about 1600° F. and then at about 1400° F.

4,907,948

NON-EVAPORABLE TERNARY GETTERING ALLOY, PARTICULARLY FOR THE SORPTION OF WATER AND WATER VAPOR IN NUCLEAR REACTOR FUEL ELEMENTS

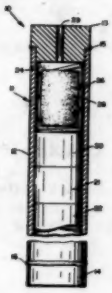
Aldo Barosi, and Claudio Boffito, both of Milan, Italy, assignors to SAES Getters S.p.A., Milan, Italy

Filed May 20, 1982, Ser. No. 380,360

Claims priority, application Italy, Feb. 5, 1979, 19903 A/79

Int. Cl.⁴ G21C *3/00*; F04B *37/02*

U.S. Cl. 417—53 **7 Claims**



1. Method for the stoichiometric sorption of both oxygen and hydrogen from water which consists of contacting water with a non-evaporable ternary gettering alloy of Zr—Ti—Fe.

4,907,949

VARIABLE FLOW PUMP

Jean-Pierre Jourde, Croissy sur Seine, and Marc Miettaux, Decines, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Continuation of Ser. No. 942,374, Dec. 16, 1986, abandoned. This application Oct. 17, 1988, Ser. No. 259,452

Int. Cl.⁴ F04B *1/00*

U.S. Cl. 417—252 **4 Claims**

1. A variable flow pump comprising means defining a chamber;

a piston movable in said chamber;

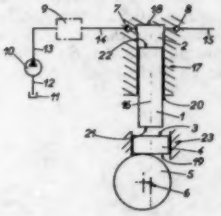
means including a surface for reciprocating said piston with a constant displacement to vary the size of said chamber, said reciprocating means being free of any continuous mechanical connection with said piston;

means including a check valve for feeding fuel to be pumped to said chamber; and

means including another check valve for delivering pumped fluid from said chamber,

wherein said feeding means includes booster pump means for pressurizing fluid being fed to said chamber and pressure regulating means fluidically positioned in a duct between said booster pump means and said chamber for regulating the pressure of fluid reaching said chamber, said pressure regulating means comprising:

(a) distributor valve means movable between a first position for closing said duct and a second position for opening said duct,



(b) a pressure limiter in said duct between said booster pump and said distributor valve means, and

(c) control means for variably controlling a control time of said distributor valve means for movement between said first and second positions for each rotation of said reciprocating means, whereby the flow of fluid through said duct is controlled by the time said distributer valve means is in said second, open position.

4,907,950

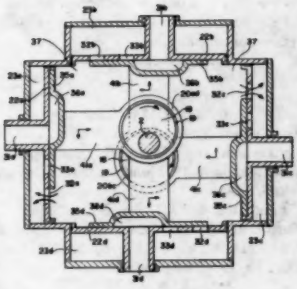
VARIABLE POSITIVE FLUID DISPLACEMENT SYSTEM

Michel A. Pierrat, 277 Forrest La., Boulder, Colo. 80301

Filed Aug. 29, 1988, Ser. No. 238,093

Int. Cl.⁴ F04B *1/00*

U.S. Cl. 417—271 **18 Claims**



1. In a variable positive fluid displacement apparatus, the combination comprising

a crankshaft,

a crankcase surrounding said crankshaft,

a displacement chamber including

a cover,

an external port extending through said cover,

a piston having first and second internal ports, and

a port plate slideably positioned adjacent said piston and having first and second spaced legs extending therefrom,

first and second eccentric drive means positioned on said crankshaft, and

means connecting said first and second legs respectively to said first and second drive means, whereby when said crankshaft is rotated, a sliding motion is imparted to said port plate to selectively close and open said ports, and said piston is driven in a direction perpendicular to the plane of the sliding motion of said port plate.

4,907,951

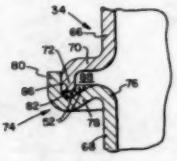
FOREIGN PARTICLE TRAP FOR A COMPRESSOR

Ronald R. Wisner, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 16, 1988, Ser. No. 245,791

Int. Cl.[4] F04B *39/02, 39/16*

U.S. Cl. 417—368 **11 Claims**



1. In a hermetic compressor which includes an outer housing, a lubricant sump in the bottom of said housing, a rotatable shaft vertically disposed in said housing above the lubricant level in the sump and means for rotating said shaft, a lubricant pick-up tube comprising one end attached to said shaft for rotation therewith and an opposite end extending vertically into said lubricant sump, said tube being open at both ends and having an axial bore defined by an inner wall of said tube extending upwardly through said tube from said opposite end, said pick-up tube being of two-piece construction comprising upper and lower members each having annular outward extensions, said extensions being joined to form a continuous annular groove extending radially outwardly from the inner surface of said pick-up tube for trapping foreign particles as they move up said pick-up tube for centrifugal force, the wall of said tube being substantially imperforate in the area of said recess mean, said annular outward extension of said lower member having a greater radial outward dimension than said annular outward extension of said upper member.

4,907,952

TURBOCHARGER

Kazuo Inoue; Shunji Yano; Hideo Yamaji, all of Tokyo; Takayuki Hirayama, and Masato Hayama, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,632

Claims priority, application Japan, Dec. 5, 1986, 61-291174; Dec. 5, 1986, 61-291178; Dec. 5, 1986, 61-291171; Dec. 15, 1986, 61-298193; Dec. 15, 1986, 61-298190

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—407 **15 Claims**

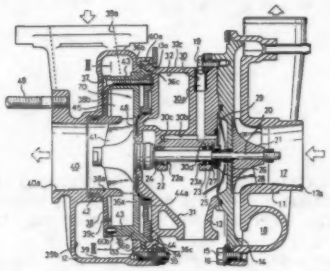
1. A turbocharger comprising:

a compressor housing accommodating a compressor wheel therein;

a turbine housing accommodating a turbine wheel therein, said turbine housing including an annular shroud disposed in surrounding relation to said turbine wheel, said shroud comprised of separate top, base and back plates assembled to cooperate for confining engine exhaust gases around the turbine wheel and with one of said plates having vanes for directing the engine exhaust gases at an outer periphery of the turbine wheel to drive the turbine wheel;

a central housing disposed between and interconnecting said compressor and turbine housings;

a shaft rotatably supported in said central housing by bearings disposed therein, said compressor and turbine wheels



being mounted on respective opposite ends of said shaft; and

positioning means held in interfitting engagement with said shroud and said central housing for positioning said shroud with respect to said central housing.

4,907,953

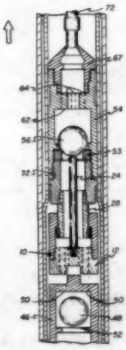
LOCKING GAS EQUALIZER ASSEMBLY

Douglas W. Hebert, P.O. Box 2335, and Elgie Harris, II, P.O. Box 185, both of Farmington, N. Mex. 87499

Filed Sep. 26, 1988, Ser. No. 249,582

Int. Cl.[4] F04B *7/00, 21/04*

U.S. Cl. 417—444 **24 Claims**



1. A method for pumping a fluid with a high gas content with a standing check valve in a standing cage and a traveling check valve in a traveling cage, comprising the steps of mechanically unseating said traveling check valve when said traveling cage is at a position nearest said standing cage;

mechanically unseating said traveling check valve momentarily as said traveling cage reverses direction at a location furtherest from said standing cage;

actuating a piston disposed between said traveling cage and said standing valve to axially reciprocate an unseating rod for engaging said traveling check valve; and

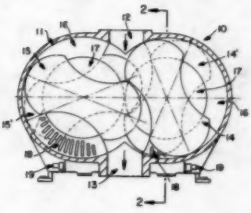
locking said piston against rotation relative to said traveling cage.

4,907,954

MULTIPLE LOBED PISTON PUMP WITH ANGULARLY AND AXIALLY DISPLACED SEGMENTS AND THROTTLE VALVE

Stanislaw Slupski, Winnipeg, Canada, assignor to Tomasz Slupski, Winnipeg, Canada

Filed Nov. 20, 1987, Ser. No. 123,546
Int. Cl.[4] F04C 18/18, 23/00, 29/08
U.S. Cl. 418—200 12 Claims



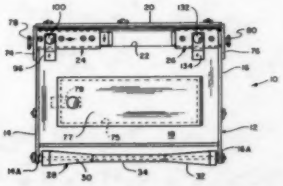
1. In a rotary positive displacement pump having inlet and outlet means, and two multiple lobed contrarotating cooperating pistons having axes of rotation, the improvment comprising each said pistons having segments, said segments being angularly displaced from each other by an angular rotation less than the angular displacement between successive lobes of the piston, respective cooperating segments of each piston being displaced substantially identical angular rotations in opposite senses, whereby each said segment cooperates with said respective cooperating segment of the other piston, each said piston rotates in a partially cylindrical body, having a partially cylindrical wall, and ring sector means projecting inward from said partially cylindrical wall and contacting said piston between said segments of said piston, said ring sector means comprising throttle valve means.

4,907,955

DRYWALL FINISHING TOOL

Jerry T. Snipes, 312 Canary, St. Charles, Mo. 63301

Filed Nov. 28, 1988, Ser. No. 276,939
Int. Cl.[4] B05B 11/02; E04F 21/06
U.S. Cl. 425—87 18 Claims



1. A tool for use in applying a smooth layer of plaster to a wall surface extending to and adjacent to an outside corner edge comprising a housing for containing a quantity of plaster, said housing having a front wall for facing a wall surface with an elongated opening extending along and adjacent to an edge thereof, first blocking means mounted on the housing for movement along the outlet opening to block a portion of one end thereof to establish a desired position for the end of the opening, means for locking the first blocking means on the housing in a desired position, said first blocking means having a guide portion extending outwardly from the front wall of the housing in alignment with the desired position of the end of the opening for engaging an outside corner edge of the wall surface to guide the one end of the opening along the outside corner edge along which plaster is to be applied during movement of the tool, the outwardly extending portion of the first blocking means acting as a guide for tool movement and preventing plaster from exiting the opening beyond the corner edge.

4,907,956

APPARATUS FOR MANUFACTURING OPTICAL INFORMATION RECORDING MEDIUM

Kozo Ezaki, Sakura; Sadaaki Shigeta, Narashino; Kazunari Sakai, Chiba; Noboru Murakami, Atsugi; Yasuyuki Tsuchiya, Shakujii, and Yuichi Fujita, Odawara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo and Global Machinery Co., Ltd., Kanagawa, both of, Japan

Filed Apr. 26, 1989, Ser. No. 343,377
Claims priority, application Japan, Apr. 27, 1988, 63-102669; Apr. 27, 1988, 63-102670
Int. Cl.[4] B29C 43/08, 43/58
U.S. Cl. 425—110 11 Claims

1. An apparatus for manufacturing an optical information recording medium, comprising:

a table on which is placed a stamper having formed thereon undulations corresponding to recording data, said table being selectively rotatable;

stamper fixing means for fixing said stamper at a central position of said table;

a center pin set to be vertically movable in correspondence with a central portion of said stamper, a support base for placement and support of a light-transmitting disk substrate formed at a position close to an upper distal end portion of said center pin;

driving means for vertically moving said center pin;

resin setting means for setting into a ring shape on the surface of said stamper placed on said table, about said center pin, a resin having a property of curing upon radiation of ultraviolet rays;

suction means, located at a central portion of said table, and including a valve mechanism to be selectively opened/-closed;

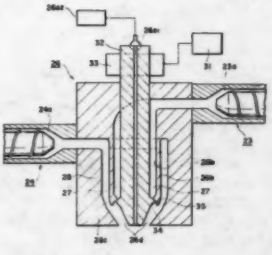
a light-transmitting weight member, having a property of transmitting, onto the resin, ultraviolet rays radiated on an upper surface thereof, said weight member being placed on the disk substrate supported by said support base; and

4,907,957

MOLDING APPARATUS FOR FORMING A PARISON AND PRODUCT OF DIFFERING MATERIALS

Tatsuya Nakagawa, Matsudo, and Yasuo Ezaki, Nitta, both of Japan, assignors to Excell Corporation, Japan

Continuation of Ser. No. 815,264, Dec. 23, 1985, abandoned, which is a division of Ser. No. 663,810, Oct. 22, 1984, Pat. No. 4,659,531. This application Sep. 15, 1988, Ser. No. 245,957
Claims priority, application Japan, Feb. 13, 1984, 59-22993
Int. Cl.[4] B29C 47/06, 47/22, 47/92
U.S. Cl. 425—132 16 Claims



1. Apparatus for manufacturing a hollow plastic product having at least a first region mainly comprised of a first mate-

rial and a second region mainly comprised of a second material, comprising:

parison discharging means for discharging a parison having a desired composition out of a discharge opening, said parison discharging means including at least one first passage substantially annular in shape and leading to said discharge opening and at least one second passage substantially annular in shape and located concentrically with said first passage and leading to said discharge opening where said first and second passages join;

first supplying means for supplying a first molding material to said first passage;

second supplying means for supplying a second molding material to said second passage;

open condition switching means for switching an open condition between said first and second passages substantially at a location where said first and second passage join such that, when one of said first and second passages is set substantially closed, the other of said first and second passages is set substantially open without a necessity to change dimensions of said discharge opening; and

control means for controlling the operating condition of each of said first and second supplying means and said open condition switching means in accordance with information regarding said product to be manufactured, thereby causing said parison discharged out of said discharge opening to be different in composition.

4,907,958

APPARATUS FOR FLANGING TUBULAR POLYMER ARTICLES

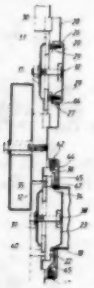
Mark I. Jones, Sussex, England, assignor to CMB Packaging (UK) Limited, Worcester, Great Britain

Filed May 27, 1988, Ser. No. 199,734

Claims priority, application United Kingdom, May 27, 1987, 8712407

Int. Cl.[4] B29C *57/02*

U.S. Cl. 425—384 **14 Claims**



1. Apparatus for flanging tubular articles of a thermoplastic polymer which has been drawn and heat-set to an elevated temperature comprising:

(a) a heating die shaped to receive an end of one of the tubular articles and to restrain said end from shrinkage, said heating die being a heated body with an annular recess dimensioned to receive the end of the tubular article,

(b) means for maintaining the heating die at a temperature at which the thermoplastic polymer is softened, said softening temperature being above the glass transition temperature of the polymer but below the elevated temperature to which it has been heat-set;

(c) means for applying an end of one of the tubular articles to the heating die so that said end is softened while restrained from residual shrinkage by the heating die;

(d) a forming die shaped to form an outward flange on said end of the tubular article, said forming die being a heated body with a boss running into an outward flange for forming the outwardly directed flange on the tubular article,

(e) means for holding the forming die at a forming temperature below the softening temperature;

(f) means for transferring the tubular article from the heating die to the forming die;

(g) means for forcing the forming die and the heat-softened end of the tubular article together to form said outward flange;

(h) means for cooling the flanged end of the tubular article while said flange is being set, said cooling means being located externally of the tubular article.

4,907,959

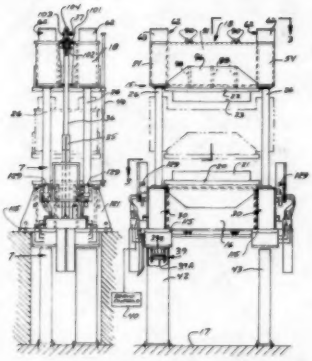
HYDRAULIC PRESS HAVING INTEGRATED COLUMN CLAMPS AND ACTUATORS

David A. Hauch, Afton, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 34,381, Apr. 2, 1987, abandoned. This application Jul. 21, 1988, Ser. No. 224,198

Int. Cl.[4] A01J *21/00*

U.S. Cl. 425—406 **24 Claims**



1. In a hydraulic press having a pair of relatively movable platen members for generating forces therebetween, the improvement comprising at least one of said platen members being supported relative to at least two elongated columns at opposite ends of the one platen member, said one platen member including a main frame extending between said columns, a plurality of spaced load pads mounted on a surface of the main frame at locations facing the other platen member and spaced inwardly from the ends of the main frame, and a flat platen clamped against the side of said main frame facing the other of said platen members and supported on the main frame only through the load pads at the locations, said flat platen having gusset means comprising walls fixed to the flat platen with planes perpendicular the plane of the flat platen to tend to distribute loads across the flat platen, said walls being connected to the main frame only through the load pads supporting the flat platen.

4,907,960

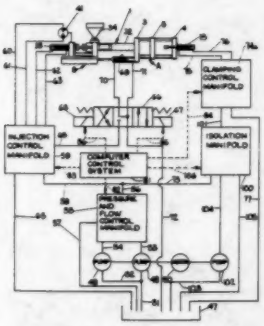
HYDRAULIC SYSTEM FOR A TOGGLE-TYPE PLASTIC INJECTION MOLDING MACHINE CAPABLE OF PRECISION COINING

Ronald A. Hertzer, Milford, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 935,294, Nov. 26, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,771

Int. Cl.[4] B29C *45/68*

U.S. Cl. 425—593 **6 Claims**



1. A hydraulic system for a toggle operated plastic injection molding machine having a hydraulically actuated injection assembly and a hydraulically actuated toggle operated mold clamping assembly, said hydraulic system comprising a reservoir for hydraulic fluid, a first pump being a low volume pump and a second pump being a high volume pump, each of said first and second pumps having an inlet and an outlet, said pump inlets being connected to said reservoir, means for controlling the pressure and flow of hydraulic fluid from said outlets of said first and second pumps, means to operate said hydraulically actuated injection assembly by said controlled hydraulic fluid from said first and second pumps, and means to operate said hydraulically actuated mold clamp assembly by said controlled hydraulic fluid from said first and second pumps for sequential operation of said injection assembly and said mold clamping assembly during simple injection molding and coining operations, a third pump being a low volume pump and having an inlet and an outlet, said inlet of said third pump being connected to said reservoir, said outlet of said third pump being normally connected to said reservoir, and means to isolate said clamp assembly operating means from said controlled hydraulic fluid from said first and second pumps and to connect said outlet of said third pump to said clamping assembly operating means whereby said injection assembly and said clamping assembly can be operated independently and simultaneously during a precision coining operation with precise and repeatable speed and position control of said clamping assembly.

4,907,961

OXYGEN JET BURNER AND COMBUSTION METHOD

John E. Anderson, Somers, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 5, 1988, Ser. No. 190,680

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[4] F23C *5/00*

U.S. Cl. 431—8 **22 Claims**

1. A method for combusting fuel and oxidant comprising:

(A) injecting into a combustion zone the major portion of the oxidant required for the combustion, said major oxidant comprising at least 30 volume percent oxygen, as at least one stream at a high velocity V which is greater than 5P where P is the volume percent oxygen in the major oxidant and V is in feet per second;

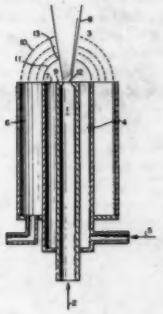
(B) injecting into said combustion zone in proximity to the major oxidant, a minor portion of the oxidant required for the combustion, said minor portion comprising at least 1 percent of the total oxygen injected into the combustion zone, said minor oxidant comprising at least 30 volume percent oxygen, at a low velocity less than 0.5 V;

(C) injecting gaseous fuel into the combustion zone in proximity to the minor oxidant to form an interface between said gaseous fuel and said minor oxidant, at a velocity such that the low velocity of the minor oxidant is within 200 feet per second of the velocity of the gaseous fuel at the interface;

(D) combusting minor oxidant with gaseous fuel at the interface;

(E) entraining minor oxidant into the high velocity major oxidant immediately after injection of the major oxidant into the combustion zone and thereafter entraining gaseous fuel into the high velocity major oxidant; and

(F) drawing hot combustion products from the interface into the high velocity major oxidant, said hot combustion products serving as a continuous source of ignition for the fuel and major oxidant, and combusting gaseous fuel and high velocity major oxidant in a stable flame.



11. Burner apparatus for use with pure oxygen or oxygen-enriched air as the oxidant comprising:

(A) means for providing major oxidant for injection into a combustion zone said major oxidant provision means connected by conduit means to a source of oxidant comprising at least 30 volume percent oxygen, and comprising a central oxidant supply tube and a nozzle at the injection end of the supply tube, said nozzle having at least one orifice therethrough for passage of oxidant from the supply tube into the combustion zone;

(B) an annular opening around the nozzle for providing minor oxidant to the combustion zone in proximity to the major oxidant injection so that minor oxidant is entrained into major oxidant immediately after injection of major oxidant into the combustion zone; and

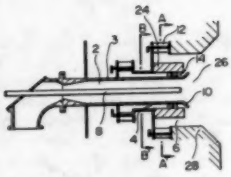
(C) means for providing gaseous fuel to said combustion zone in proximity to the minor oxidant provision means so that said gaseous fuel and minor oxidant form an interface within the combustion zone prior to contact between gaseous fuel and major oxidant.

4,907,962

LOW NOX BURNER

Shigeru Azuhata, Hitachi; Kiyoshi Narato, Ibaraki; Hironobu Kobayashi, Katsuta; Kenichi Sohma, Hitachi; Tooru Inada, Hitachi; Norio Arashi, Hitachi; Hiroshi Miyadera, Hitachi, and Masao Masutani, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki, both of Tokyo, Japan

Filed May 26, 1987, Ser. No. 54,391
Claims priority, application Japan, May 26, 1986, 61-119259
Int. Cl.[4] F23C *5/00*
U.S. Cl. 431—174 **18 Claims**



1. A low NOx burner comprising:

means for defining a pulverized coal passage for injecting a flow of a mixture of pulverized coal and primary air;

means for defining a secondary air passage arranged externally of and coaxially with said pulverized coal passage;

means for defining a tertiary air passage arranged externally of said secondary air passage and disposed coaxially with said pulverized coal passage with an outer peripheral wall extending parallel to said pulverized coal passage;

swirl flow generator means for injecting secondary air and tertiary air as a respective swirl flow;

said secondary air passage defining means and said tertiary air passage defining means including spacer means disposed to project between said secondary air passage and said tertiary air passage and having a thickness sufficient for forming a recirculation flow between said secondary air and said tertiary air at a location adjacent to said spacer means which has an outer peripheral surface constituting an inner peripheral wall of said tertiary air passage with said outer peripheral surface extending parallel to said pulverized coal passage; and

flame holder means provided on a free end of said pulverized coal passage defining means for forming a swirl flow between said flow of the mixture of the pulverized coal and the primary air and a flow of said secondary air.

4,907,963

BURNER BRACKET

Glenn C. Neff, Altamonte Springs, Fla., assignor to Combustion Tec, Inc., Orlando, Fla.

Filed Jul. 11, 1988, Ser. No. 217,361
Int. Cl.[4] F23C *5/06;* **B05B** *15/06*
U.S. Cl. 431—189 **17 Claims**

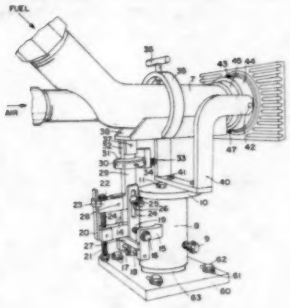
1. An adjustable mounting bracket assembly for adjusting and securing horizontal, vertical, and horizontal and vertical angular positions of the axis of a tube, comprising:

a base comprising base horizontal adjusting means for adjusting and securing a horizontal position of said base with respect to ground and base vertical adjusting means for adjusting and securing a vertical and rotational position of said base with respect to said ground;

gimbal bracket means extending from said base and holding gimbal means comprising two concentric gimbal rings, the outer said gimbal ring pivotally attached to said gimbal bracket and the inner said gimbal ring pivotally attached to said outer gimbal ring to pivot at 90° with respect to the pivot axis of said outer gimbal ring;

a saddle supporting said tube at a position spaced from said gimbal rings and comprising longitudinal adjusting means for adjusting and securing the longitudinal position of said tube on said saddle, said tube fixedly retained within said inner gimbal ring toward one end of said tube; and

horizontal angular adjusting means having one side attached to said base and an adjustable second side attached to said saddle moving said saddle for adjusting and securing said



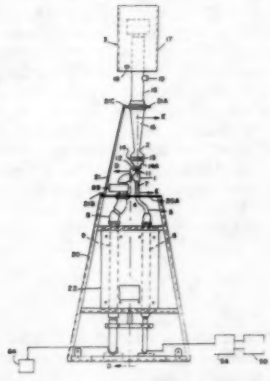
horizontal angular position of said tube axis, and vertical angular adjusting means having one side attached to said base and an adjustable second side attached to said saddle moving said saddle for adjusting and securing said vertical angular position of said axis of said tube.

4,907,964

DEVICE FOR EXTRACTING AND BURNING METHANE

Stephen Howarth, Nottingham, and William L. Hole, Duffield, both of United Kingdom, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 414,081, Sep. 1, 1981, abandoned. This application Oct. 25, 1984, Ser. No. 664,746
Claims priority, application United Kingdom, Sep. 29, 1981, 8129334
Int. Cl.[4] F23D *14/00, 14/08*
U.S. Cl. 431—202 **7 Claims**



1. An apparatus for extracting and burning inflammable gas from landfill refuse sites, comprising,

a support frame having a truncated triangular shape,

a first venturi having a high pressure inlet connected to a source of compressed air,

a low pressure inlet connected to a source of inflammable gas, and an outlet for delivering a mixture of inflammable gas and compressed air, the first venturi being supported

vertically above the support frame by a horizontal support plate disposed at the top of the support frame,

an upper support plate extending upwardly from the top of the support frame and being connected to the support frame at its distal end,

a second venturi having a high pressure inlet connected to the outlet of the first venturi, a low pressure inlet being defined by a gap between an axially movable collar and a proximal end of an outlet for the second venturi, a distal end of the second venturi high pressure inlet extending into the proximal end of the second venturi outlet, the second venturi outlet being supported vertically above the second venturi high pressure inlet by connection to a distal end of the upper support plate,

a burner having an inlet connected to a distal end of the second venturi outlet and being supported vertically above the second venturi outlet by connection to the distal end of the support plate.

4,907,965

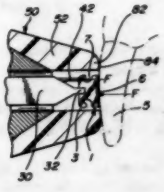
ELECTROTHERMAL DENTAL DEBRACKETING TOOL AND METHOD OF REMOVAL

Patrick E. Martin, Laguna Beach, Calif., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Filed Apr. 29, 1988, Ser. No. 187,696

Int. Cl.[4] A61C 7/00

U.S. Cl. 433—3 **15 Claims**



1. A device for removing a dental bracket having a tie wing and archwire slot extending from a face attached to a tooth comprising:

a heating element for emplacement in the archwire slot of said bracket;

pulling means attached to said heating element, said pulling means capable of attachment to the tie wing of a dental bracket;

a body portion resiliently connected by spring means to said heating element and said pulling means;

a nose portion attached to said body portion and enclosing said pulling means and said heating element, such that said pulling means and said heating element, such that said pulling means and said heating element are retractable into said nose portion; and

switch means capable of activating said heating element, said switch means connected to said body portion and operable during the motion of said heating element into the archwire slot of said bracket, such that when said pulling means are attached to said dental bracket, said spring means exert a regulable force on said pulling means which is transferred to said dental bracket.

4,907,966

IMPRESSION TRAY FOR RETENTION OF IMPRESSION MATERIAL

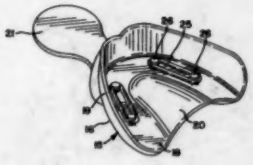
Christopher K. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.

Filed May 11, 1989, Ser. No. 350,317

Int. Cl.[4] A61C 9/00

U.S. Cl. 433—37 **10 Claims**

1. A dental impression tray comprising a body of substantially rigid material shaped like the jaw of a person, said body including a cavity for receiving impression material, said cavity being defined by a bottom and upstanding outer flange means, and means for retaining impression material in the cavity during separation of the material from the mouth, said means including spaced anchoring means on the body and at least one elastomeric member stretched on the anchoring



means to be engaged by the impression material to inhibit separation of the impression material from the tray when removing the tray/impression material from the mouth after the taking of an impression while thereafter facilitating removal of used impression material from the tray and cleaning of the tray following the recording of the impression.

4,907,967

PARAOCCLUSIVE DENTAL INSTRUMENT

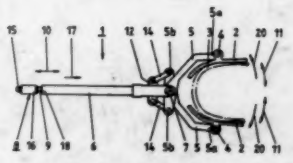
Martin Mai, Büttnergasse 1, A-1232 Vienna, Austria

Filed Nov. 8, 1988, Ser. No. 268,946

Claims priority, application Austria, Nov. 10, 1987, 2967/87

Int. Cl.[4] A61C 19/64

U.S. Cl. 433—73 **17 Claims**



1. A paraocclusive instrument comprising, in combination:

(a) two holding jaws laterally applicable to the lower dental arch;

(b) a rod-shaped basic element in communication with said holding jaws to transfer movement of the lower jaw to display and/or recording devices;

(c) pivot arms, said holding jaws being pivotally connected at a central region thereof to said pivot arms, said pivot arms also being pivotally mounted to said basic element and extending divergingly from the basic element to the pivotal connection with said holding jaws; and

(d) lockable adjustment means at said basic element engaging said and serving to adjust the mutual position of the pivot arms.

4,907,968

DENTAL SYRINGE SHIELD OR PROPHYLACTIC

Mark R. Eisner, 2895 Hamilton Blvd., Ste 205, Allentown, Pa. 18104, and Charlton D. Becker, 321 Barrett Rd., Emmaus, Pa. 18049

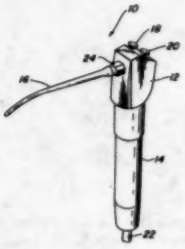
Filed May 6, 1988, Ser. No. 190,816

Int. Cl.[4] A61G 17/02

U.S. Cl. 433—80 **21 Claims**

1. A removable disposable dental syringe covering, shield or prophylactic for placement over and in proximate contact with the nozzle of a dental syringe for significantly reducing the spread of communicable diseases which may be transmitted by or through contact with human body fluids and tissues during

a first and subsequent uses of the dental syringe in conjunction with the treatment of two or more patients comprising an elongated cylindrical portion for fitting over the nozzle of the dental syringe and a barrel portion for fitting over the nozzle securing means of the dental syringe, and further comprising a



backsplash collar shield means, which fits over the nozzle portion and abuts the front of the base portion of the dental syringe, for preventing body tissues and/or fluids expelled from the mouth of a patient from attaching or adhering to other portions of the dental syringe.

4,907,969

UNIVERSAL DENTAL PROSTHESIS RETENTION SYSTEM

Whitley S. Ward, 2171 Forest La., Naples, Fla. 33940

Filed Apr. 14, 1988, Ser. No. 181,517
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 **7 Claims**

1. A universal dental prosthesis retention system for interconnecting a dental implant to a dental prosthesis comprising:

an implant insert having a first longitudinal axis and securely engageable into the dental implant;

a prosthesis insert having a second longitudinal axis and securely engageable into the dental prosthesis;

a universal connector adapted to interconnect said implant insert and said prosthesis insert and adapted to allow said first and second axes to be either colinearly or adjustably moved universally out of alignment to a maximum acute angle one to another about a point of articulation at the intersection of said first and said second axes as defined by said universal;

means for securely locking said universal connector to maintain a preselected angular alignment between said first and second axes;

an enlarged ball disposed at the upper end of said implant insert;

a socket disposed at the lower end of said prosthesis insert; said ball matably and securely trapped within said socket to facilitate said interconnection and said universal articulation;

said prosthesis insert and said socket are split longitudinally into halves, said halves spaced apart and interconnected by a threaded fastener;

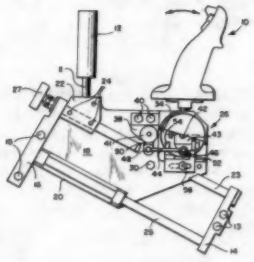
said threaded fastener adapted to forcibly urge said socket halves against said ball to inhibit relative movement therebetween.

4,907,970

SIDESTICK-TYPE THRUST CONTROL SIMULATOR

Raymond P. Meenen, Jr., Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,381
Int. Cl.[4] G09B *9/08*
U.S. Cl. 434—45 **2 Claims**



1. An aircraft thrust control simulator comprising:

a handgrip having a mounting shaft;

a slip clutch having a shaft extending transversely of the handgrip shaft and connected thereto for imparting preselected friction in response to displacement of the handgrip;

linkage means connected at a first end to the handgrip shaft for translating handgrip displacement to a corresponding linkage displacement;

transducer means connected to a second end of the linkage means for electrically measuring the handgrip displacement;

a support means for mounting all of the above-indicated means;

a pair of parallel spaced threaded rails mounting the support means;

adjusting means connected to the rails for threadingly screwing the rails relative to the support means thereby displacing the handgrip to a position particularly suited for a pilot.

4,907,971

SYSTEM FOR ANALYZING THE SYNTACTICAL STRUCTURE OF A SENTENCE

Ruth L. Tucker, 1130 Pacific Beach Dr., San Diego, Calif. 92109

Filed Oct. 26, 1988, Ser. No. 262,988
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—167 **12 Claims**

1. A method of syntactically categorizing the constituents of an English language sentence, comprising the steps:

(a) defining all expressions of the subject of a sentence, all expressions modifying said subject expressions, and all expressions modifying said expressions modifying said subject expressions to be members of a first functional set,

(b) defining all expressions of action being performed by or upon a subject expression of a sentence, all expressions linking the subject expression to a predicate expression, all expressions modifying said action or linking expressions, and all expressions modifying said expressions modifying action or linking expressions to be members of a second functional set,

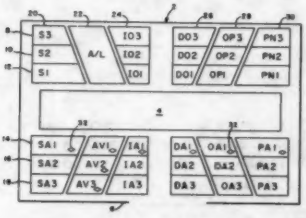
(c) defining all expressions of an indirect object of any ac-

tion, all expressions modifying said indirect object expressions, and all expressions modifying said expressions modifying said indirect object expressions to be members of a third functional set,

(d) defining all expressions of a direct object of any action, all expressions modifying said direct object expressions, and all expressions modifying said expressions modifying said direct object expressions to be members of a fourth functional set,

(e) defining all expressions which are an object of a preposition, all expressions modifying said object of preposition expressions, and all expressions modifying said expressions modifying said object of a preposition expressions to be a fifth functional set,

(f) defining all predicate expressions, all expressions modifying said predicate expressions, and all expressions modifying said expressions modifying said predicate expressions to be members of a sixth functional set,



(g) defining each member of the first through sixth functional sets which is in word form to be a member of a first form set,

(h) defining each member of the first through sixth functional sets which is a phrase to be a member of a second form set,

(i) defining each member of the first through sixth functional sets which is a clause to be a member of a third form set,

(j) defining each member of the first through sixth functional sets which is a foundation element to be a member of a first class set,

(k) defining each member of the first through sixth functional sets which modifies a foundation element to be a member of a second class set, and

(l) defining each member of the first through sixth functional sets which modifies a modifier to be a member of a third class set.

4,907,972

BABY WALKING STRAPS

Frank Marolda, 744 Inverrary La., Deerfield, Ill. 60015

Filed Jul. 6, 1988, Ser. No. 215,785
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—255 **6 Claims**

1. A system for assisting a baby's first steps comprising:

first and second elongated flexible strap members each having first and second longitudinal ends;

first loop means at a first longitudinal end of each said strap member for allowing an individual to manually grasp and support said strap member, said first loop means being defined by a portion of said respective strap member that has been turned and fastened to the remainder of the strap;

second loop means defined at said second longitudinal end of each said strap member for allowing an infant to manually grasp said second longitudinal end of said strap member, said second loop means being defined by a flexible fork-shaped strap element formed from the material provided for each said member and a rigid crossbar member coupled to and mounted to extend across an open end of said fork-shaped strap element; and

at least one of said strap members further comprising a safety strap element fixedly coupled at one end thereof to one of said flexible fork-shaped element and said rigid cross bar member at said second longitudinal end of said respective strap member and including means for coupling to a wrist of an infant,

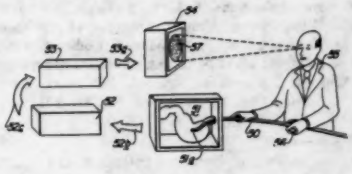
whereby when an infant grasps said second end of each said strap member in each hand and an individual grasps said first end of each strap member in each hand, the infant can be guided and assisted in taking steps while the individual is in a fully upright position.

4,907,973

EXPERT SYSTEM SIMULATOR FOR MODELING REALISTIC INTERNAL ENVIRONMENTS AND PERFORMANCE

David C. Hon, 1450 Northwest Woodbine Way, Seattle, Wash. 98103

Filed Nov. 14, 1988, Ser. No. 270,012
Int. Cl.[4] G09B *23/28*
U.S. Cl. 434—262 **42 Claims**



1. An investigative medical system comprising:

(A) a physical model representing physically and spatially at least that portion of a patient on which a selected medical procedure is to be performed;

(B) at least one implement representing a medical procedural tool normally employed in conducting said selected medical procedure;

(C) moving means for moving and controlling said implement within said model;

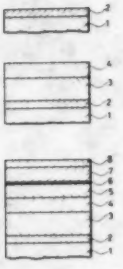
(D) first memory means for storing data representing the internal landscape of said at least that portion of said patient; and

(E) means interconnected with said moving means and responsive to the position of said implement for producing and displaying a visual presentation of that portion of said internal landscape representing the region adjacent the active portion of said implement.

4,907,974
METHOD OF GROWING A SEMICONDUCTOR DEVICE STRUCTURE

Yukio Gotoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 19, 1988, Ser. No. 145,544
Claims priority, application Japan, Feb. 13, 1987, 62-32004
Int. Cl.[4] H01L 21/265
U.S. Cl. 437—129 2 Claims



1. A method of making a crystalline semiconductor device including a plurality of compound semiconductor layers, at least one of said layers including an element such as A1 that can react with impurities such as oxygen during the crystal growth thereof, thereby harming the electronic properties of that layer comprising:

growing directly on a surface of a GaAs substrate a layer of A1GaAs as a getter layer for reacting with and removing impurities from the ambient during growth of the layer;

growing a layer of GaAs directly on and covering said getter layer as a first buffer layer; and

successively growing as a laser structure on said first buffer layer layers of A1GaInP, GaInP, and A1GaInP.

4,907,975
ELECTRICAL CONNECTOR UTILIZING FLEXIBLE ELECTRICAL CIRCUITRY

David W. Dranchak, Endwell; David E. Engle, Vestal; David E. Hessian, Binghamton; Alan D. Knight, Newark Valley; Wai M. Ma, Endicott; Thomas G. Macek, Endicott, and John J. Squires, Endicott, all of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Dec. 19, 1988, Ser. No. 285,971
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—67 10 Claims

1. An assembly for connecting flexible circuit means to connectors on a substrate member and connections on a card member comprising;

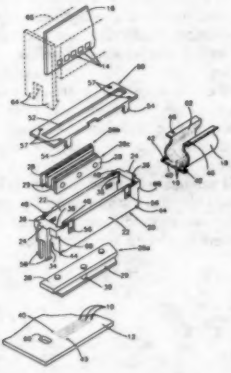
a housing member;

first resilient pressure exerting means carried by said housing member and adapted to receive flexible circuit means reeved thereon and positioned to urge said reeved portions of said flexible circuit means against the connectors on the substrate to cause electrical contact;

second and third individual pressure exerting means carried by said housing independently of each other and of said first pressure exerting means, and being positioned in spaced juxtaposed relationship and defining an opening therebetween;

locating means to maintain one leg portion of said flexible circuit positioned in contact with the second pressure exerting means and another leg portion of said flexible circuit means positioned in contact with the third pressure exerting means, said two leg portions of said flexible circuit defining therebetween a slot to receive a circuit card; said slot being of less width than the thickness of the circuit card;

whereby when said card is inserted in said slot and the

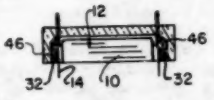


reeved portion of the flexible circuit means is in contact with the connectors on said substrate a circuit connection is establish between said substrate and said card through said flexible circuit.

4,907,976
CONNECTOR

Peter Killcommons, New York, N.Y., assignor to Killy Corporation, New York, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,441
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—72 20 Claims



1. An apparatus for providing electrical connections to an integrated circuit having conductive input/output pins extending in a first direction away from the integrated circuit comprising:

a non-conductive base having a primary surface and adjacent sides around the perimeter of the primary surface extending in a direction away from the primary surface thereby forming a cavity, said cavity of a size and shape to physically mate with the integrated circuit when the base is placed over the integrated circuit such that the sides extend in the same direction as the input/output pins;

at least one conductive contact to provide electrical connection to the input/output pins, comprising:

a lower portion located inside the cavity having a bias toward the center of the cavity and positioned such that it aligns with and touches one of said input/output pins when the apparatus is placed over the integrated circuit; and

an upper portion located on the primary surface of the base and electrically connected to the lower portion, said upper portion having a size and shape to electrically and physically mate with a contact of another device;

whereby electrical connection is provided between the integrated circuit and said other device; and

a first clamping means to lock the apparatus over the integrated circuit, said clamping means comprising at least

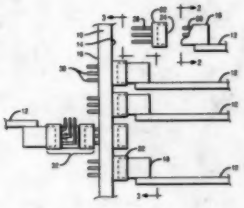
one flange located on the inside of the cavity, said flange engaging with an edge of the integrated circuit to lock the apparatus over the integrated circuit.

4,907,977

COMPUTER BACKPANEL INVERSION COUPLER

Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 14, 1988, Ser. No. 258,260
Int. Cl.[4] H05K *1/07*
U.S. Cl. 439—74 **19 Claims**



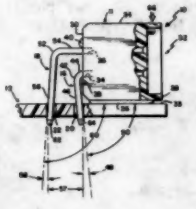
1. In a computer system the improvement comprising:
a plurality of printed circuit boards, each having a PCB connector attached to one end thereof, said connector having a plurality of PCB pins extending oppositely away from said board, said pins being configured in a plurality of rows;
a plurality of backpanel connectors, each having a socket on one side engageable with the PCB pins of a circuit board and having a plurality of BP pins on the opposite side extending away from the PCB pins, wherein said BP pins have the same configuration as said PCB pins;
a backpanel with a front and back side and having a plurality of holes extending therethrough for receiving said BP pins from the front side, wherein said BP pins extend through said backpanel and their ends extend out the back side of said backpanel; and
an inversion coupler for connecting said BP pin ends to a printed circuit board and mounting said board to the back side of said backpanel.

4,907,978

SELF-RETAINING CONNECTOR

David C. Bowen, Downers Grove, Ill., assignor to Robinson Nugent, Inc., New Albany, Ind.

Filed Nov. 2, 1988, Ser. No. 266,106
Int. Cl.[4] H01R *23/70*
U.S. Cl. 439—79 **21 Claims**



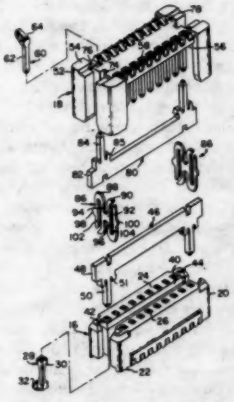
1. A connector mountable on a circuit board, the connector comprising
a body member having a bottom wall,
a first electrical contact pin coupled to the body member and configured to extend downwardly below the bottom wall and to align with the bottom wall to define an obtuse included angle therebetween to provide first spring means for yieldably pulling the bottom wall away from the circuit board upon insertion of the first electrical contact pin in an aperture formed in the circuit board, and
a second electrical contact pin coupled to the body member and configured to extend downwardly below the bottom wall in splayed relation to the first electrical contact pin and to align with the bottom wall to define an acute included angle therebetween to provide second spring means counteracting the first spring means for yieldably urging the bottom wall into seated engagement on the circuit board upon insertion of the second electrical contact pin into a second aperture formed in the circuit board.

4,907,979

SURFACE MOUNT, MINIATURE, BUSSING CONNECTOR

Steven Feldman, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 603,802, Apr. 25, 1984, Pat. No. 4,616,893. This application Oct. 30, 1985, Ser. No. 792,956
The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—83 **10 Claims**



1. A solderable surface mount connector for use in establishing surface mount solder interconnections to a printed circuit board, comprising:
a housing of insulative material having a plurality of terminal passages therein;
a plurality of electrical terminals, each mounted in respective terminal passages, each having a compliant surface mount solder tail extending therefrom and comprising means for soldered surface interconnection to a circuit on the printed circuit board;
a rigid elongate electrically conductive bus bar attachable to the housing and attachable to the printed circuit board in electrical engagement with electrically conductive pads on the printed circuit board; and
legs attached to the bus bar, each more rigid than the compliant solder tails, comprising means for mounting the bus bar to the printed circuit board through holes therein and further comprising means for securing the housing to the printed circuit board, the legs further comprising means for electrically interconnecting the bus bar to the electrically conductive pads on the printed circuit board.

4,907,980

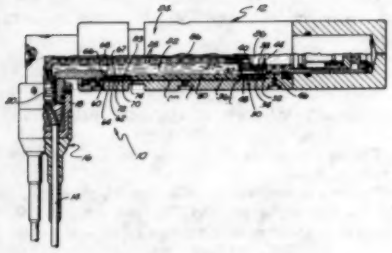
PRESSURE COMPENSATING CONNECTOR ASSEMBLY

James P. Wagaman, Chatsworth, and Gordon A. Porter, Agoura, both of Calif., assignors to Kintec, Inc., Chatsworth, Calif.

Continuation of Ser. No. 265,426, Oct. 31, 1988. This application Jul. 14, 1989, Ser. No. 380,160

Int. Cl.[4] H01R *13/523*

U.S. Cl. 439—204 6 Claims



1. A pressure compensation apparatus for a connector assembly with at least one coupling member comprising a housing with a cable receiving end having a cable receiving orifice therethrough, an interface end with an insert member therein configured to mate with another coupling member, and first means positioned in the cable receiving orifice whereby the cable, comprising at least one wire, extends through the first means, the housing defining a circumferential chamber with a circumferential surface extending between the first means and the insert member, the cable extending through the chamber to couple to the insert member, the chamber having disposed therein a substantially incompressible non-electrically conducting fluid, the pressure compensation apparatus for equalizing the pressure between the inside of the chamber and the outside environment while preventing fluid communication between the chamber and the outside environment comprising:

a first cylindrical mating sleeve positioned in the chamber and having a first surface for sealing contact against the circumferential surface of the chamber and a second surface spaced inwardly from the circumferential surface of the chamber for providing a space between the second surface and the circumferential surface of the chamber;

a second cylindrical mating sleeve positioned in the chamber in spaced relationship to the first mating sleeve, the second mating sleeve having a third surface for sealing contact against the circumferential surface of the chamber and a fourth surface spaced inwardly from the circumferential surface of the chamber for providing a space between the fourth surface and the circumferential surface of the chamber;

an elastomeric boot having a first end mounted on the second surface of the first mating sleeve and having a second end mounted on the fourth surface of the second mating sleeve to thereby bifurcate the chamber into an interior region inside the boot and an exterior region radially between the boot and the surface of the chamber and longitudinally between the first surface and the third surface;

the housing having a pressure equalizing orifice therethrough at a location whereby the exterior region of the chamber communicates with the environment outside the connector, the incompressible fluid being confined to the interior region of the chamber.

4,907,981

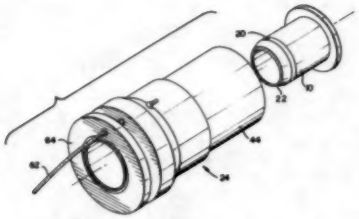
QUICK-RELEASE ELECTRICAL CONNECTOR COUPLING DEVICE

David O. Gallusser, Oneonta, and Gene L. Snyder, Bainbridge, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Nov. 15, 1988, Ser. No. 271,286

Int. Cl.[4] H01R *13/625*

U.S. Cl. 439—258 15 Claims



1. A coupling device for releasably coupling first and second portions of an electrical connector comprising:

(a) a receptacle member attached to the first electrical connector portion;

(b) a plug shell attached to the second electrical connector portion;

(c) a housing member slidably mounted on the plug shell so as to slide in a generally axial direction;

(d) releasable latching means to latch the housing member and receptacle member together such that the electrical connector portions are in mating engagement;

(e) releasable locking means to releasably lock the housing member and the plug shell together;

(f) operating means associated with the housing member and movable between a locking position which prohibits disengagement of the latching means thereby locking the housing member and the receptacle together and the first and second electrical connector portions in mating engagement, and a release position which permits disengagement of the latching means thereby decoupling the housing member and the receptacle; and,

(g) disengagement means to disengage the first and second portions of the electrical connector from mating engagement before the operating means reaches its release position.

4,907,982

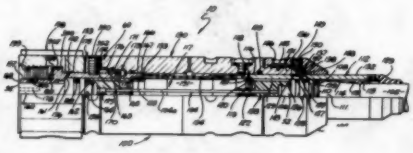
ELECTRICAL CONNECTOR FOR HIGH PRESSURE ENVIRONMENTS

James P. Wagaman, Chatsworth, Calif., assignor to Kintec, Inc., Chatsworth, Calif.

Filed Nov. 30, 1988, Ser. No. 278,140

Int. Cl.[4] H01R *23/70*

U.S. Cl. 439—271 11 Claims



1. A connector for high pressure environments comprising a first assembly coupled to the end of a first cable having at least one first wire and a second assembly coupled to a second cable having at lease one second wire, the second assembly configured to mate with the first assembly to thereby connect the first

cable to the second cable, the first and second assemblies each comprising:

a front shell having an axially disposed front shell interior surface with a circumferentially disposed front shell interior surface groove therein and an axially disposed front shell exterior surface with a circumferentially disposed front shell exterior surface groove therein;

a feed-through insert positioned in the front shell, the feed-through insert having a cable facing end for receiving the cable, a wire facing end opposite the cable facing end through which the individual wires of the cable protrude, and a radially disposed feed-through insert abutment flange;

retaining means positioned for extending radially from the front shell interior surface groove for defining a radially extending retainer abutment shoulder;

a front tube spacer having a spacer rear end in abutting relationship against the retainer abutment shoulder and a spacer front end opposite the spacer rear end in abutting relationship against the feed-through insert abutment flange whereby the feed-through insert is axially aligned and retained in the front shell;

a housing having a housing interior surface, a rear region, a circumferential housing interior thread at the rear region and a front region, the front region positioned in sealed relationship over the front shell exterior surface, the front region of the housing having a circumferentially disposed housing exterior thread;

first interconnect means positioned between the housing interior surface and the front shell exterior surface for interconnecting the housing and the front shell in axially and rotationally immoveable relationship;

a housing end nut positioned over the interconnect means and having a interior radially disposed nut abutment shoulder for abutment against the interconnect means and a circumferential nut interior thread for threading onto the housing exterior thread for retaining the housing on the front shell exterior surface;

a rear shell having a rear shell outside surface, a front facing, radially extending rear shell abutment shoulder and a rear shell front end with a shell interior thread therein;

a contact insert having a contact front end for receiving the ends of the wires and a contact rear end with at least one mating contact, and further having a rear facing radially disposed contact insert abutment flange for abutting against the rear shell abutment shoulder and having a front facing radially disposed contact insert abutment shoulder;

a rear tube spacer having a first end in abutting relationship against the contact insert abutment shoulder and a second end opposite the first end;

a spacer tube retaining nut having an exterior thread for being threaded into the shell interior thread, the spacer tube retaining nut having one end abutting against the second end of the rear tube spacer for causing the contact insert abutment flange to be pressed into contact against the rear shell abutment shoulder for axially positioning and retaining the contact insert in the rear shell;

second interconnect means between the rear shell outside surface and the housing interior surface for interconnecting the housing and the rear shell in axially and rotationally immoveable relationship; and

a housing retaining nut having a retaining nut front end with a nut exterior thread for threadingly mating with the housing interior thread for retaining the extension housing on the rear shell;

the first assembly further having an engaging nut on the first assembly rear shell axially adjacent the housing retaining nut in rotationally moveable but axially retained relationship on the rear shell, the engaging nut having an engaging nut interior thread;

the rear shell of the second assembly further having an outside threaded engaging end, the engaging nut threadingly engageable with the outside threaded engaging end for coupling the first and second assemblies together whereby the mating contacts of the first and second assemblies are coupled together for electrically coupling the first and second cables.

4,907,983

ELECTRICAL CONNECTOR

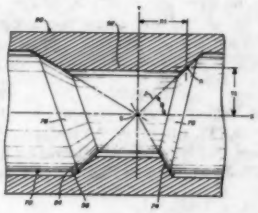
Ronald A. Wilson, Medway, Mass., assignor to Microwave Development Laboratories, Needham, Mass.

Continuation-in-part of Ser. No. 864,739, May 13, 1986, Pat. No. 4,775,325, which is a continuation of Ser. No. 729,642, May 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 610,268, May 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 579,404, Feb. 13, 1984, abandoned. This application Apr. 20, 1988, Ser. No. 183,974

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] H01R *13/405, 17/04*

U.S. Cl. 439—278 **34 Claims**



20. An electrical connector comprising, an outer conductor connector body having a center bore, a sleeve in the outer conductor body bore and adapted to be mated substantially therewith, said body center bore and the outer circumference of said sleeve having therebetween interlocking means comprising spaced mating circumferential wall surfaces on both ends thereof, at least segments of said spaced wall surfaces of the outer conductor and the sleeve being in contact, each of the wall surfaces on at least one end of the interlocking means being formed as a frusto-conic surface, and the wall surfaces on both ends of the interlocking means converging in a direction so as to project to a common point.

4,907,984

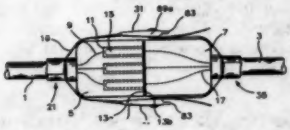
TEMPORARY SECURING DEVICE FOR ELECTRIC CORDS

Lee S. Keller, 1015 S. Clementine St., Oceanside, Calif. 92054

Filed Feb. 17, 1989, Ser. No. 311,767

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—369 **17 Claims**



1. A device for temporarily securing the engagement of joined end plugs of end-to-end interconnected first and second electric cords, comprising:

(a) a first removable, flexible, electrically insulated harness, including first adjustable collar means for encircling the first electric cord, adjacent its end plug, and having at least two bands, of terminal length extending from said collar means toward the plug, each having attached thereto an electrically insulated cinch wherein each cinch

includes a pair of elongated opposed side walls held in spaced-apart relation by a plurality of fixed, spaced-apart cross-arms spanning therebetween, a cinch bar interior of said cross-arms, spanning said sidewalls and arranged normal to the long axis of a strap to be introduced thereinto and a pair of sharp edges formed respectively on said cinch bar and an adjacent cross-arm in spaced-apart, facing relationship so that when said strap in inserted into said cinch, looped about said cinch bar and threaded back around said adjacent cross-arm on which said sharp edge is formed, said strap passes over said sharp edges and forms a self-locking configuration in said cinch when said terminal end of said strap is pulled tight; and,

(b) a second removable, flexible, electrically insulated harness including second adjustable collar means for encircling the second electric cord, adjacent its end plug, and having at least two elongated straps extending from said collar means toward said cinches, each strap of a length sufficient to be threaded into and back out of said cinches when the plugs are interconnected;

(c) wherein a clasping action is developed in said cinch, independent of said straps and bands and the surfaces thereof, to secured said joined end plugs.

4,907,985

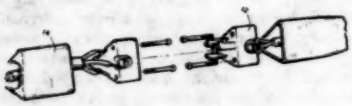
SAFETY TWIST LOCK CONNECTOR FOR AN EXTENSION POWER CORD

Cary T. Johnsen, 233 Neptune St., Encinitas, Calif. 92024

Filed Jun. 26, 1989, Ser. No. 370,992

Int. Cl.[4] H01R *13/625*

U.S. Cl. 439—369 **8 Claims**



1. Safety interlocking connectors for temporary extension power cords comprising:

a first female connector attached to a first extension power cord at a first end; and

a second male connector attached to a second extension power cord at a first end,

said first and second connectors mate at their distal ends to interconnect said first and second extension power cord,

said first and second connectors have at least one flat resting surface and their largest dimension configuration is at their distal ends and are linearly scaled downward in that same configuration toward said first ends.

4,907,986

ADAPTER FOR STATION PROTECTOR

Mark W. Muller, 6865 Meadowcrest #614, North Richland Hills, Tex. 76180

Filed Oct. 20, 1988, Ser. No. 260,503

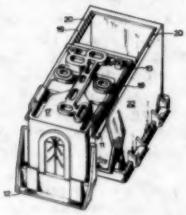
Int. Cl.[4] H01R *13/40*

U.S. Cl. 439—535 **5 Claims**

1. An adapter for mounting a station protector to a cover, the station protector comprising a base having a wall mounted perpendicular to the base at one end of the base, the wall having an opening which should not be blocked by the adapter, the adapter comprising:

(a) a first plate;

(b) a second plate having an opening therein, the second plate mounted to the first plate; and



(c) first mounting means for mounting the first and second plates to the base and wall, the second plate opening facing the wall opening.

4,907,987

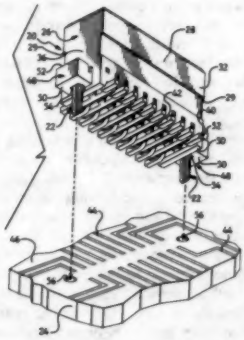
CONNECTOR WITH BARBED BOARDLOCK

George H. Douty, Mifflintown; David J. Fabian, Mount Joy; Timothy L. Kocher, Camp Hill, and Joseph R. Reagan, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 4, 1988, Ser. No. 265,790

Int. Cl.[4] H01R *13/74*

U.S. Cl. 439—571 **18 Claims**



1. An electrical connector for mounting to a printed circuit board, comprising:

a dielectric housing having a boardlock receiving recess and a mounting face;

a boardlock disposed in said recess, said boardlock having a first portion received in said recess in an interference fit, said boardlock having a second portion comprising spring means extending from said first portion to an end beyond said mounting face for reception in a boardlock receiving aperture in the printed circuit board, said spring means having barb means thereon positioned along the spring means between the first portion and the end to engage wall means of the boardlock receiving aperture.

4,907,988

CONTACT PIN

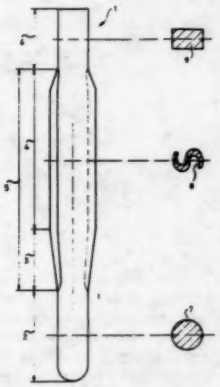
Wilhelm Tilse, Birkenfeld, Fed. Rep. of Germany, assignor to Inovan G.m.b.H. & Co. KG, Metalle und Bauelemente, Birkenfeld, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,166

Claims priority, application European Pat. Off., Mar. 15, 1988, 88104048.9

Int. Cl.[4] H01R *13/42*

U.S. Cl. 439—751 7 Claims



1. A contact pin for insertion into metal-coated bores of contact panels, said pin consisting of a leading guide section, an axially subsequent contact section and a connecting section, said contact section being S-shaped in cross-section thereby providing opposite curved radial spring arms with contact surface areas at the radial ends of the arms adapted to provide predetermined specific contact surface pressures over the full axial length of the contact section, said S-shaped spring arms having vertices between the center line of the pin and the outer ends of the arms and the cross-section of said arms being largest at said vertices.

4,907,989

TERMINAL BLOCK INSERT DEVICE SCREW

Paul Huska, 739 Moreno Ave., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 194,537, May 15, 1988, Pat. No. 4,832,628. This application Feb. 23, 1989, Ser. No. 314,114

Int. Cl.[4] H01R *4/38*

U.S. Cl. 439—812 15 Claims

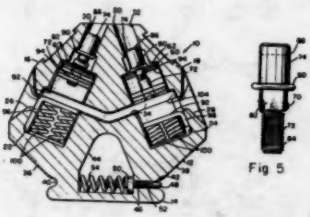


Fig 5

1. A terminal block screw or the like for engaging first inner walls of a first opening in a first surface of a first body while selectively engaging second inner walls of a second opening in a second surface of a second body, comprising an upper portion and a lower portion with different geometries which allow quick and releasable engagement of said screw to the first body by engaging the first inner walls to the first opening of the first surface.

4,907,990

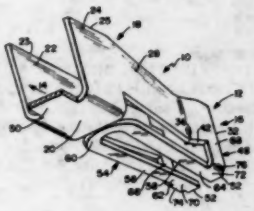
ELASTICALLY SUPPORTED DUAL CANTILEVER BEAM PIN-RECEIVING ELECTRICAL CONTACT

Dominique Bertho, Ballysheedy, Ireland; Helen M. P. Dechelette, Paris, France, and Eugene J. Myniak, Lisle, Ill., assignors to Molex Incorporated

Filed Oct. 7, 1988, Ser. No. 255,001

Int. Cl.[4] H01R *11/22*

U.S. Cl. 439—851 8 Claims



1. A method for making a metallic terminal including a pin-receiving contact portion, said method comprising the steps of:

stamping sheet metal stock to define at least one terminal blank including a base portion, a first outer pair of parallel beams extending from opposed sides of said base portion to a forward end, a second inner pair of arms extending between said first pair of beams, said inner arms being joined together at one end adjacent to the base by a bight portion and the opposed end of each of said inner arms being connected in tadem to the forward end of its adjacent outer beam by a linking element;

forming a contact portion on each of said outer beams; and

thereafter, forming up the opposed sides of said blank to form a U-shaped member such that the contact portions of said beams are positioned to slideably receive and electrically engage an inserted male pin terminal.

4,907,991

CONNECTIVE JUMPER

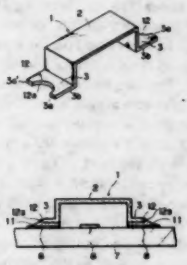
Eiji Kobayashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1988, Ser. No. 197,971

Claims priority, application Japan, Nov. 25, 1987, 62-298111

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—876 5 Claims



1. A longitudinal connective jumper provided to extend between a pair of conductors on an insulating substrate and to

be soldered to said conductors, said connective jumper comprising:

a jumper body having two end portions; and

jumper connecting portions being formed to outwardly extend from both said end portions of said jumper body and extending in a direction parallel to the substrate surface on which the conductors are located, each of said jumper connecting portions having a continuous end edge surface comprising two transverse edge surfaces and a recessed concave edge surface disposed between said two transverse edge surfaces;

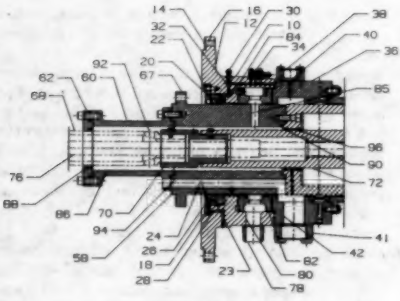
wherein said recessed concave edge surface and the surface area of said connective jumper are plated and said transverse edge surfaces are not plated.

4,907,992

OIL DISTRIBUTION BOX FOR A MARINE CONTROLLABLE PITCH PROPELLER

Joseph L. Cavallaro, Canton, Mass.; Arthur J. Richards, Jr., Glendale, R.I., and Charles A. Busche, Hanson, Mass., assignors to Bird-Johnson Company, Walpole, Mass.

Filed Oct. 17, 1988, Ser. No. 258,480
Int. Cl.[4] B63H *3/00*
U.S. Cl. 440—50 **7 Claims**



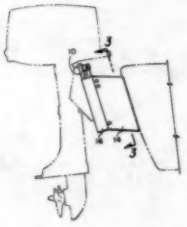
1. An oil distribution box for a marine controllable pitch propeller of the type having a main hydraulic servo within a hub for controlling the pitch of propeller blades rotatably carried by the hub and including a directional valve actuated by linear motion of a tubular valve rod extending through the propeller shaft from the oil distribution box, comprising an outer stationary housing; a shaft received within the housing and adapted to be coupled to the propeller shaft for rotation therewith; an auxiliary servo in the housing including a cylinder coupled to the shaft and defining a servo chamber and a piston received for axial movement in the servo chamber, coupled to the valve rod and dividing the chamber into sections on its opposite sides; means for supplying high pressure oil from a source to the valve rod for conduction by the valve rod to the main hydraulic servo and including an elongated annular supply chamber defined between the shaft and the valve rod by spaced-apart seals, a port in the valve rod opening to the supply chamber, a port in the shaft opening to the supply chamber and a journal clearance sea between the housing and shaft in register with the port in the shaft; and means for supplying oil under pressure from a source selectively to either section of the servo chamber and returning oil to the source from the other section including for each section a supply-return passageway in the cylinder communicating with the respective section, a passage in the housing, a journal clearance seal between the housing and the cylinder in register with the passage and the passageway and a normally closed pilot-operated check valve in the suppy-return passageway adapted to open in response to the supply of oil under pressure to either of the passageways such that oil is supplied to the selected section and returned from the other section.

4,907,993

OUTBOARD MOTOR MOUNTING APPARATUS

William V. Thompson, Rte. 3, Box 73, Perry, Fla. 32347

Filed Jul. 28, 1988, Ser. No. 225,267
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **17 Claims**



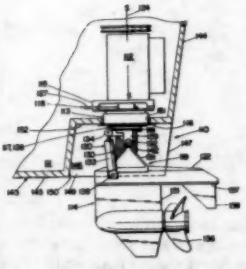
1. An apparatus for raising and lowering an outboard motor relative to the transom of an associated boat, comprising a transom bracket mountable on a boat transom; a motor mounting plate, slidably mounted on the transom bracket for receiving a motor thereon and means for sliding the motor mounting plate relative to the transom bracket whereby a motor mounted on the motor mounting plate can be raised and lowered; wherein the transom bracket comprises two side plates extending rearward relative to the transom, wherein the side plates each have on the inside surface thereof a longitudinal channel within which opposite side edges of the motor mounting plate are located, said channels having a normally solid synthetic organic polymer bearing surface extending throughout the total length of said channel and contacting the front and rear faces of said mounting plate as well as the side edges of said mounting plate; said apparatus further including adjusting means for adjustably moving at least a portion of at least one of said side plates toward the other said side plate so as to provide a selected amount of force on the motor mounting plate.

4,907,994

L-DRIVE

David D. Jones, Mequon, Wis., assignor to US Marine Corporation, Hartford, Wis.

Filed Jun. 15, 1987, Ser. No. 62,244
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—61 **15 Claims**



1. A combination steering and trimming assembly for a boat propulsion drive, said combination designed to mount through

a hole in a bottom surface of the boat, the combination comprising

a steering and trimming assembly including a steering assembly member extending upwardly through the hole in the bottom surface of the boat, said steering assembly member constructed to rotate about a generally vertical axis, and a trimming assembly member for trimming the drive, said trimming assembly member connecting by horizontal pivot means to said steering assembly member, said trimming assembly member constructed to rotate about a generally horizontal axis.

4,907,995

MOORING DEVICE

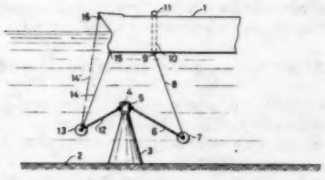
Leendert Poldervaart, La Turbie, and Patrick Ducousso, Falicon, both of France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

Filed Mar. 2, 1989, Ser. No. 318,144

Claims priority, application Netherlands, Apr. 8, 1988, 8800915

Int. Cl.[4] B63B *22/02*

U.S. Cl. 441—3 **5 Claims**



1. Mooring device, comprising a ship or similar floating device, a structure placed on and fixed to the water bottom and provided with an element which rotates about a vertical axis, a rigid arm which is fixed to the element so that it can rotate about a horizontal axis, and which extends in a direction away from the element and is loaded by a weight, and a connecting element which resists tension and which is connected at one end to the arm and at the other end to the ship, characterized in that the first-mentioned element has connected to it a second rigid arm which is rotatable about a horizontal axis and is directed in the opposite direction to that of the first arm, and which is also loaded by a weight and connected to the ship by a connecting element which resists tension.

4,907,996

MOORING SYSTEM

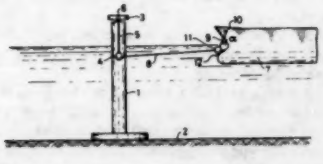
Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings Inc., Marly, Switzerland

Filed Mar. 2, 1989, Ser. No. 318,143

Claims priority, application Netherlands, Apr. 11, 1988, 8800932

Int. Cl.[4] B63B *22/02*

U.S. Cl. 441—3 **3 Claims**



1. Mooring system, comprising a mooring device, a ship, and between mooring device and ship a rigid arm each of the two ends of which is fixed to a connecting element loaded by a weight, one of these connecting elements being coupled to the mooring device, and the other to the ship, characterized in that at least one of the ends of the rigid arm is coupled to a connecting element which is held in a pre-tensioned state by the weight, in such a way that said weight cannot be displaced until after the connecting element and weight at the other end of the rigid arm have undergone a certain shift.

4,907,997

SURVIVAL CRAFT

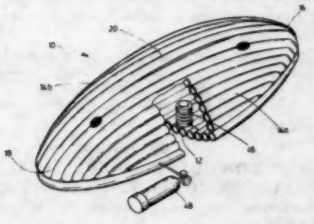
Joseph S. Hall, 281 Miami Drive, Keswick, Ontario, Canada L4P 2Z5

Filed Oct. 19, 1988, Ser. No. 259,910

Claims priority, application Canada, Apr. 26, 1988, 565122

Int. Cl.[4] B63B *7/08*

U.S. Cl. 114—345 **6 Claims**



1. A single person survival craft comprising a bottom panel, and two side panels, the bottom panel, in turn, comprising a plurality of hollow tubular structures, said bottom panel having two pointed ends, and a wide mid-section, there being two full length peripheral hollow tubular structures, and a predetermined number of intermediate reduced length hollow tubular structures in the region of said bottom panel mid-section, said number of tubular structures progressively decreasing towards each of said pointed ends, said tubular structures in said bottom panel being of curved shape said two full length peripheral hollow tubular structure, and at least some of said intermediate hollow tubular structures being curved around a radius which decreases progressively from said mid-section to each of said ends, adjacent said hollow tubular structures being joined to one another in side by side abutting relationship: and each of said side panels having pointed ends and a wide mid-section, and there being a predetermined number of hollow tubular structures at said mid-section and said numbers of said tubular structures decreasing progressively from said mid-section towards each of said pointed ends, each said side panel being joined to said bottom panel along a first edge at the adjacent respective ones of said full length peripheral hollow tubular structures of said bottom panel, and, there being releasable closure means extending along portions of a second edge of each said side panel, whereby said second edges may be at least partially opened up and closed together, and air permeable mesh means in at least one of said side panels.

4,907,998

A RESILIENTLY DEFORMABLE CONTAINER FOR MERCURY, AND LAMP AND METHOD OF ITS MANUFACTURE USING SUCH A CONTAINER

William L. Kuijer; Jacobus P. K. M. Van As, and Frans J. Traksel, all of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1985, Ser. No. 734,418

Claims priority, application Netherlands, May 18, 1984, 8401596

Int. Cl.[4] H01J *9/38*

U.S. Cl. 445—9 5 Claims

1. An elongated container for dispensing a dose of mercury, comprising a plate-shaped part having a width greater than the thickness thereof, and a mercury-containing portion having a given width in the width direction of said part; said plate-shaped part comprising a waist portion having a width less than said given width, and a resilient portion having a width greater than the width of said waist portion; said waist portion being arranged in the direction of elongation between said resilient portion and said mercury-containing portion,

characterized in that said resilient portion has a centrally formed hole extending therethrough in the thickness direction, defining strips on respective opposite sides of the hole, the hole having a width greater than the respective widths of said strips, and

said resilient portion extends completely around the periphery of the hole.

4,907,999

DEVICE FOR HOLDING A SUBSTANTIALLY PARALLELEPIPED SHAPED PART IN POSITION

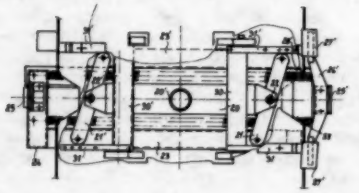
Arturo Sbordonne, Anagni, Italy, assignor to Videocolor, Montrouge, France

Filed Nov. 10, 1988, Ser. No. 269,705

Claims priority, application France, Nov. 13, 1987, 8715672

Int. Cl.[4] H01J *9/22*

U.S. Cl. 445—66 6 Claims



1. A device for holding a substantially parallelpiped-shaped part in position, comprising:

a base;

a support device fixed to said base and on which said part rests, said supporting device including means for pre-positioning the part, solidly joined to the base, and at least three supporting points fixed to the base so as to be vertically movable and at least two supporting elements for clamping the part on two opposite sides, said two supporting elements being fixed by a deformable quadrilateral element so that there is a continuously variable distance between said two supporting elements.

4,908,000

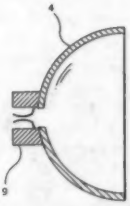
SONIC WINDMILL FOR BICYCLES

Gerald W. Counts, Irondale, Mo.

Filed Jul. 24, 1989, Ser. No. 383,994

Int. Cl.[4] A63H *33/40*

U.S. Cl. 446—216 1 Claim



1. A horizontal wind vane rotating around a vertical shaft affixed to the handle bar of a bicycle wherein the improvement comprises:

(a) a plurality of equal length rods extending radially from a central hub rotatable around the top of a vertical shaft;

(b) cup shaped wind vanes affixed to the external ends of a radial rods;

(c) the axis of the cup shaped vanes normal to the axis of the radial rods;

(d) the axis of the cup vanes having an axial orifice accommodating an air operated whistle element;

(e) the vertical shaft extending downwards to a ball fitting nesting in a socket clamp;

(f) the socket clamp having a socket arrangement on one end;

(g) the second end of the clamp having a circulator portion for clamping on the bicycle handle bar; and

(h) the clamp secured to the ball fitting/handle bar by a mid-section threadable member.

4,908,001

SOFT LATEX FIGURE AND METHOD OF MAKING THE SAME

Thomas O. Kopian, 21 Roslyn Dr., Glen Head, N.Y. 11545

Filed Jun. 20, 1988, Ser. No. 209,199

Int. Cl.[4] A63H *3/36*

U.S. Cl. 446—385 15 Claims

1. A method of manufacturing soft latex figures comprising the steps of:

providing a form to serve as a supporting base structure which approximates the size and shape of the torso of the figure to be created,

applying a soft modeling material to the form of sufficient size to form the appendages of the figure to be created,

sculpting the soft modeling material to produce the desired shape of the appendages including the detailed features to be produced,

applying a molding material to the sculptured appendages and allowing it to harden to produce a mold of the appendages,

mixing coloring material with pre-vulcanized liquid latex

rubber and pouring the liquid latex mixture into the mold, and slush molding the mixture therein to form a thin latex replica of the appendage cast in the mold, and repeating this step sufficient number of times to achieve the desired thickness and strength for the latex appendages,

removing the sculpted appendages from the form and wrapping the form with a soft batting material,

securing the molded latex appendages formed in the mold on the form in the appropriate positions,

mixing a coloring material with pre-vulcanized liquid latex in a suitable container to form a colored latex bath having the general color of the desired finished figure,

making strips of conventional paper toweling and saturating the strips in the colored liquid latex bath and thereafter removing the excess liquid latex from the paper toweling,

applying the latex saturated paper toweling strips to the form, overlapping the attached molded latex appendages at their juncture with the form and covering all of the exposed areas of the form, and allowing the layer of saturated paper toweling to dry,

during the drying process, the previously molded latex appendages becoming integrally joined to the layer of saturated paper toweling to form an integral first layer of the outer skin of the figure torso,

cutting or otherwise removing the skin formed by the latex paper toweling and integral appendages from the form,

stuffing the skin with a sufficient quantity of suitable soft fill material of desired density to achieve the desired shape retention characteristics of the figure,

sealing any undesired seams, holes, or openings by applying latex saturated paper toweling thereover,

coating the first layer of skin with a sufficient quantity of colored liquid latex until the texture of the paper toweling is no longer visible and the desired strength and thickness is achieved, and

after the latex coating has dried, painting or otherwise coloring desired portions of the figure to add finishing touches or create any additional features, highlights, or shadows, desired for the finished effect.

4,908,002

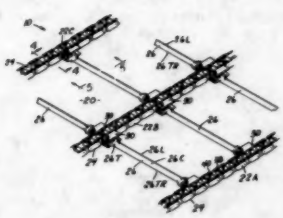
COMBINE CONVEYOR

Dale R. Tanis, Naperville, Ill., assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 101,499, Sep. 28, 1987, Pat. No. 4,787,400. This application Nov. 7, 1988, Ser. No. 268,012

Int. Cl.[4] A01F *7/00*

U.S. Cl. 460—114 **20 Claims**



1. In a combine conveyor of the type having a conveyor surface, at least two chains having parallel reaches along the surface, elongated carriers extending across the surface and means securing opposite ends thereof with respect to the chains, the improvement comprising:

resiliently deformable slats as the carriers; and

at least one of the securing means of the chain and the respective slat end including an attachment link attached to the chain, the slat end and attachment link having an elongated slot and a pivot post through the slot and relatively movable therein to accommodate multi-dimensional movement of slat ends with respect to the attachment link, said pivot post being the sole pivot point in said securing means,

thereby allowing self-adjustment of the position and orientation of the slat ends such that the slats can respond to loads, forces and obstacles without damage to the conveyor.

4,908,003

HYSTERESIS MECHANISM FOR A TORQUE VARIATION ABSORBING DEVICE

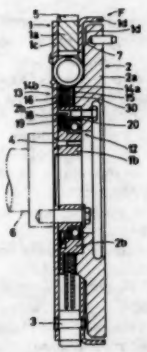
Kiyonori Kobayashi, Chiryu; Masakazu Kamiya, Toyoake, and Junji Kagiyama, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 19, 1988, Ser. No. 245,900

Claims priority, application Japan, Sep. 19, 1987, 62-142295[U]

Int. Cl.[4] F16D *3/14*; **F16F** *15/12*

U.S. Cl. 464—68 **2 Claims**



1. A torque variation absorbing device comprising a flywheel assembly connected to an engine crankshaft and defining an inertia body divided into two parts including a drive side flywheel and a driven side flywheel, said drive side flywheel and said driven side flywheel being rotatably supported for rotation about an axis by a bearing arrangement which is positioned between the drive side flywheel and the driven side flywheel, said driven side flywheel comprising first and second bodies, said first body including a plurality of circumferentially spaced threaded holes, a plurality of threaded bolts disposed in said holes for connecting said second body to said first body, said bolts terminating short of ends of said holes facing said drive side flywheel, said first body and said drive side flywheel being axially spaced to define a gap therebetween, a spring mechanism operative to transfer torque between the drive side flywheel and the driven side flywheel, and a hysteresis mechanism positioned radially inwardly of both said spring mechanism and said gap, said hysteresis mechanism comprising a thrust plate including bent portions extending into said ends of said holes left unoccupied by said bolts, spring means biasing said thrust plate toward said drive side flywheel, and a friction plate axially compressed between said thrust plate and said drive side flywheel, said friction plate disposed in radial alignment with said gap so that dust abraded from said friction plate is discharged into said gap.

4,908,004

TORSION DAMPING DEVICE WITH MOVEMENT TRANSMITTING ELEMENT

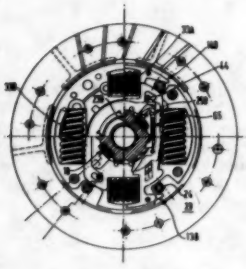
Michel Graton; Michel-Andre Courcol, both of Paris, and Jacques Thiebaut, Chanteloup-les-Vignes, all of France, assignors to VALEO, Paris, France

Filed Mar. 31, 1988, Ser. No. 176,290

Claims priority, application France, Apr. 2, 1987, 87 04614; Aug. 3, 1987, 87 10991

Int. Cl.[4] F16D *13/68*; F16F *15/12*

U.S. Cl. 464—68 **14 Claims**



1. A torsion damping device, comprising a hub, at least one transverse hub flange encircling the hub and being connected therewith by meshing means with play; first circumferentially-acting elastic means disposed between the hub flange and the hub, at least one flange coupled to the hub flange by second circumferentially-acting elastic means, said at least one flange encircling the hub but not being connected to it; an interposing element comprising two movable plates, responsive to centrifugal force, mounted for movement between a standby position in which the plates are inactive and, above a set speed of rotation, an operating position, in which they intervene between the hub and the hub flange for at least one direction of rotation, by driving in the direction of rotation at least a part of the second circumferentially-acting elastic means other than those which normally act between them; and return means operable to urge said movable plates towards their standby position; and wherein said movable plates are connected to one another by at least one transmission element, said transmission element being mounted for rotation relative to the plates such that a radial displacement of one of the movable plates causes rotation of the transmission element and a corresponding radial displacement in the opposite direction of the other movable plate.

4,908,005

AXIALLY RETAINED WIDE FLEXING ANGLE HOMOKINETIC JOINT

Jean C. Van Dest, Saintry S/Seine; Pierre Guimbretiere, Neauphlesle Chateau; Bernard Poulain, Conflans Sainte Honorine, and Francois Verbrugge, Cergy, all of France, assignors to Glaenzer-Spicer, Poissy, France

Division of Ser. No. 250,138, Sep. 27, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 411,235

Claims priority, application France, Oct. 1, 1987, 87 13597; May 26, 1988, 88 07035

Int. Cl.[4] F16D *3/23*

U.S. Cl. 464—111 **14 Claims**

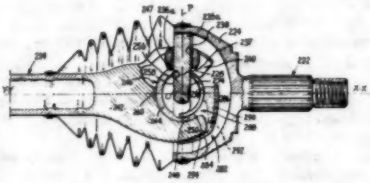
1. A homokinetic joint for coupling two shafts, comprising:

a tripod element for connection to one of the shafts, said tripod element comprising three trunnions, rollers having substantially spherical outer surfaces and slidably mountable on respective said trunnions, and a central axis;

a tulip element connected to the other shaft, said tulip element comprising three substantially toroidally shaped rolling tracks for receiving said rollers therein so that said rollers can run in said tracks and axial branches defining a concave spherical surface; and

an axial retaining means for axially maintaining said tripod element and said tulip element in position relative to each other, said axial retaining means comprising an intermediate member, and said intermediate member having a convex spherical surface complementary to and cooperating with said concave spherical surface of said tulip element and a connection means for connection with said tripod element such that said tripod element is movable in a plane perpendicular to said central axis;

wherein said intermediate member haas a plane surface perpendicular to said central axis and legs extending axially from said plane surface between said trunnions of said



tripod element, said tripod element has an opposite first contact zone confronting and cooperating with said plane surface and a second contact zone parallel to said first contact zone, said axial retaining means further comprises urging means, in contact with said tulip element, for urging said tripod element in a direction parallel to said axis to maintain contact between said first contact zone and said plane surface of said intermediate member, said urging means comprising a support member slidably mounted relative to and between said legs of said intermedate member for sliding movement parallel to said central axis, said support member having a plane face perpendicular to said central axis and cooperating with said second contact zone.

4,908,006

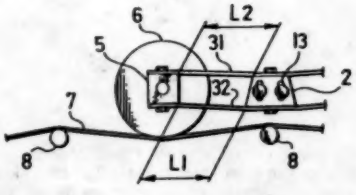
BELT TIGHTENING DEVICE FOR OPEN-END SPINNING MACHINES

Frantisek Burysek, Ústí nad Orlicí; Miloslav Kubovy, Dolní Dobrouc; Agaton Planansky, and Milos Mládek, both of Ústí nad Orlicí, all of Czechoslovakia, assignors to V zkumny Ústav Bavlnársk , Ústí nad Orlicí, Czechoslovakia

Filed Oct. 12, 1988, Ser. No. 256,835

Int. Cl.[4] F16H *7/12*

U.S. Cl. 474—117 **10 Claims**



1. A belt tightening device for open-end spinning machines with spinning units arranged side-by-side on a machine frame and provided with spinning rotors driven, through driving pulleys, by means of an endless belt which is tightened by tightening rolls supported in bearing boxes attached to a holder on the machine frame, wherein the improvement comprises a pair of flat swing legs for supporting the bearing box of the belt

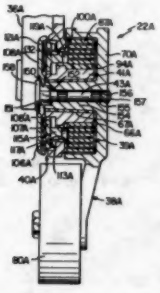
tightening roll, said pair of flat legs extending along the endless driving belt in spaced relationship to each other, and being formed by leaf springs.

4,908,007

BELT TENSIONER AND METHOD OF MAKING THE SAME

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 276,084, Nov. 23, 1988. This application Aug. 17, 1989, Ser. No. 395,112
Int. Cl.[4] F16H 7/12
U.S. Cl. 474—135 20 Claims



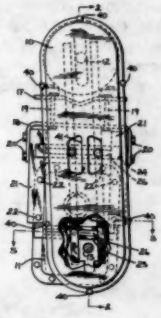
1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, first spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and frictional dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, said dampening means having a longitudinal axis, said support means comprising a shaft means having a longitudinal axis and being fixed from movement relative to said belt engaging means, said belt engaging means having a portion thereof being rotatably carried by said shaft means so as to rotate relative to said shaft means, said dampening means comprising a pair of frictionally engaging first and second parts with said first part comprising an annular pad of friction material that is coaxially disposed and axially movable on said shaft means relative to said second part, second spring means urging said first part against said second part with a certain spring force, said first part of said dampening means having guide means thereon, said one of said support means and said belt engaging means having opening means therein that receive said guide means therein from one side thereof to guide axial movement of said first part, and a bearing member having bearing means disposed in said opening means and receiving said guide means therein, the improvement wherein said bearing member has said bearing means thereof disposed in said opening means from the other side of said one of said support means and said belt engaging means.

4,908,008

SAFETY GUARD

John R. Gorski, Fox Point, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Nov. 7, 1988, Ser. No. 268,254
Int. Cl.[4] F16H 57/02, 7/18
U.S. Cl. 474—146 14 Claims



1. A safety guard for enclosing a flexible drive between an assemblage of a drive shaft and a driven shaft, comprising:

a backplate having elongated openings adapted to receive the driving and driven shafts, said openings being elongated along a line through the shafts;

a cover releasably mounted against the backplate and defining therewith an enclosure for the flexible drive;

at least one mounting track attached to the rear of the backplate; and

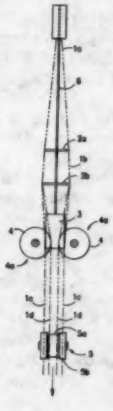
a mounting nut slidably positioned within the mounting track and adapted to receive a bolt for attaching the safety guard to the assemblage of the driving and driven shaft.

4,908,009

CORNER-FORMING UNIT OF A CARTON CONTAINER-FORMING MACHINE

Yoshimitsu Yokoyama, Ishikawa, Japan, assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 22, 1988, Ser. No. 274,851
Int. Cl.[4] B31B 1/36; B65H 45/22
U.S. Cl. 493—178 1 Claim



1. Method to form corners on a web of material to be made

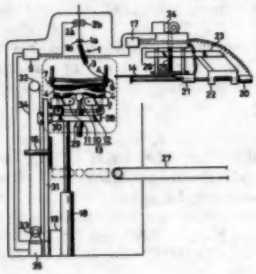
into individual cartons comprising the steps of: supplying a flat, longitudinally sealed web of material, expanding the web of material into tube-like shape, forming the tube-like shape having opposed small sides each extending between a pair of corners into a rectangular shape while simultaneously pressing the small sides of the rectangle inward towards one another to form each small side into a v-shape with an inwardly extending apex, and clamping the outer portions of the rectangular shaped web of material to press the corners of each pair together without clamping the apices of the v's formed in the sides of the web, thereby creasing each of the corners of the web of material, whereby neatly creased folded edges are provided for said individual cartons.

4,908,010

APPARATUS FOR FOLDING AND CUTTING PAPER

Isamu Yoshioka, Fussa, Japan, assignor to Toppan Moore Co., Ltd., Japan

Filed Oct. 29, 1987, Ser. No. 114,613
Claims priority, application Japan, Oct. 31, 1986, 61-260147; Oct. 31, 1986, 61-260148; Oct. 31, 1986, 61-260149
Int. Cl.[4] B05B *1/14*
U.S. Cl. 493—357 **4 Claims**



1. An apparatus for folding and cutting a continuous length of paper, the paper having a longitudinal direction and fold lines spaced along the longitudinal direction, the fold lines dividing the paper into a series of adjacent sheets, said apparatus comprising:

a folding mechanism for moving the paper in a zigzag fashion to fold the paper across the fold lines and to stack the sheets on top of each other;

a vertically movable supporting table for supporting the sheets stacked by said folding mechanism, said supporting table descending according to the quantity of sheets supported thereon; and

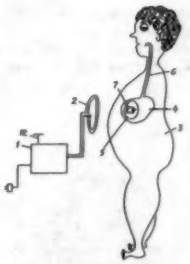
a cutting mechanism for cutting the paper when a desired quantity of sheets is supported on said supporting table, said cutting mechanism having a cutting edge with a tip which is pierced into an upper surface of one of the sheets while the sheet is being folded onto the stack and before an adjacent sheet is moved by the folding mechanism to be folded onto the stack, said cutting edge descending with said supporting table as the paper is folded, the cutting edge moving horizontally to cut the paper at one of the fold lines when said supporting table reaches a predetermined position.

4,908,011

METHOD AND DEVICE FOR PERFORMING A PUNCTURING WORK ON AN INFLATED BALLOON-LIKE OBJECT IMPLANTED IN A PATIENT

Erik Jacobsen, Helsingor; Christian Overland, Hundested; Allan Northeved, Farum, and Carsten Langkaer, Herlev, all of Denmark, assignors to Ballobes ApS, Denmark

PCT No. PCT/DK87/00060, § 371 Date Mar. 22, 1988, § 102(e) Date Mar. 22, 1988, PCT Pub. No. WO87/07132, PCT Pub. Date Dec. 3, 1987
PCT Filed May 21, 1987, Ser. No. 144,918
Claims priority, application Denmark, May 22, 1986, 2408/86
Int. Cl.[4] A61N *1/00*
U.S. Cl. 600—12 **14 Claims**



4. In combination with an inflatable balloon which can be implanted in a patient's body, an apparatus for puncturing said balloon when in an inflated condition and when in a patient's body, said apparatus comprising

an electrically-activatable puncturing means located in said balloon,

a high-frequency receiver system located in said balloon and connected to said electrically-activatable puncturing means,

an antenna coil which is positionable near the patient's body, and

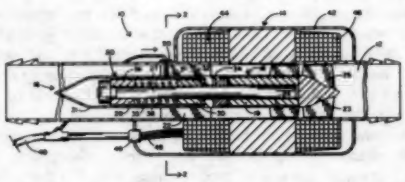
a high-frequency generator connected to said antenna coil, said high-frequency generator causing said antenna coil to emit a high-frequency electromagnetic field which causes said high-frequency receiver system to generate an electric current which causes said puncturing means to puncture the balloon.

4,908,012

CHRONIC VENTRICULAR ASSIST SYSTEM

John C. Moise, Carmichael; Richard K. Wampler, Rancho Cordova, and Kenneth C. Butler, Carmichael, all of Calif., assignors to Nimbus Medical, Inc., Rancho Cordova, Calif.

Filed Aug. 8, 1988, Ser. No. 229,624
Int. Cl.[4] A61B *19/00*
U.S. Cl. 600—16 **12 Claims**



1. An implantable ventricular assist system for patients with chronic cardiac disease, comprising:

(a) a blood pump including a blood tube adapted to form a part of a blood path within said patient;

(b) a pump stator mounted coaxially within said blood tube to form an annular blood duct within said tube, said pump stator being mounted within said blood tube by a plurality of stator blades;

(c) a pump rotor supported for rotation in said pump stator on hydrodynamic bearings, said pump rotor and pump stator together defining with said blood tube a smooth annular blood path around said pump rotor and pump stator;

(d) a permanent magnet motor rotor integral with said pump rotor;

(e) a motor stator encircling said blood tube radially adjacent said motor rotor; and

(f) means wholly external of said tube for transmitting electrical power from an extracorporeal source to said motor stator;

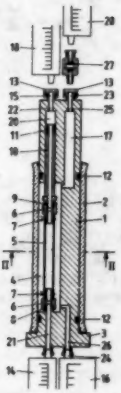
(g) whereby said power transmitting means do not create any discontinuity in the wall of said blood path.

4,908,013

HOLDER FOR A VEIN SEGMENT AND METHOD OF REMOVING CELLS FROM A VEIN SEGMENT

Werner Muller, Wiesendangen; Marie-Claude Hensel, Bertschikon, and August Huber, Raterschen, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 25, 1988, Ser. No. 160,160
Claims priority, application Switzerland, Mar. 3, 1987, 825/87
Int. Cl.[4] A61B *19/00*
U.S. Cl. 600—36 20 Claims



1. A holder for a vein segment comprising

a base having a pair of end walls defining a laterally accessible recessed chamber for receiving a vein segment;

a closure element mounted on said base in hermetically sealed relation to close said chamber;

a pair of flow channels each flow channel being disposed in a respective wall of said base and communicating said chamber with the exterior of said base;

a vein segment holding and tensioning means disposed in said chamber for mounting a vein segment between and in communication with said flow channels for passage of fluid therebetween; and

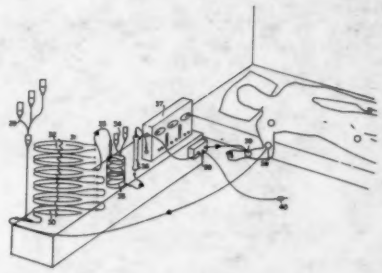
at least a third flow channel in said base communicating a periphery of said chamber with the exterior of said base.

4,908,014

EXTRACORPORAL THERMO-THERAPY DEVICE AND METHOD FOR CURING DISEASES

Karl K. K. Kroyer, 19 Boulevard de Suisse, Monte-Carlo 98000, Monaco

Division of Ser. No. 837,688, Mar. 10, 1986, Pat. No. 4,787,883.
This application Sep. 21, 1988, Ser. No. 247,385
Int. Cl.[4] A61M *1/03*
U.S. Cl. 604—4 9 Claims



1. An extracorporal thermo-therapy apparatus for use in continuously treating the blood of a patient for disease, said extracorporal apparatus comprising:

first connector means for removing a flow of blood from a patient,

second connector means for returning said flow of blood to said patient, and

a flow circuit connected between said first connector means and said second connector means, said flow circuit including:

a heating means for raising the temperature of said flow of blood so as to stimulate its production of white blood cells and antibodies and attenaute or kill viruses and undesired cells therein,

a first supply means for adding treatment chemicals to said flow of blood before it enters said heating means,

a second supply means for adding additional treatment chemicals to said flow of blood after it leaves said heating means, and

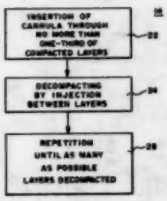
a pumping means for moving said flow of blood through said flow circuit.

4,908,015

CATARACT REMOVAL TECHNIQUE

Aziz Y. Anis, 9540 Firethorn La., Lincoln, Nebr. 68520

Filed Jul. 26, 1988, Ser. No. 224,579
Int. Cl.[4] A61B *17/00*
U.S. Cl. 604—22 10 Claims


INSERTION OF CANNULA THROUGH NO MORE THAN ONE-THIRD OF COMPACTED LAYERS
DECOMPACTING BY INJECTION BETWEEN LAYERS
REPETITION UNTIL AS MANY AS POSSIBLE LAYERS DECOMPACTED

1. A method comprising the steps of:

inserting a cannula through at least one of a plurality of layers of compacted material in the lens of an eye;

injecting fluid in a volume between 1/500 and 1/10 a milli-

liter to separate the layers of the lens cortex and lens nucleus;

repeating the above steps at least two more times, whereby the nucleus and cortex of the lens are decompacted; and

fragmenting the decompacted layers of the lens.

4,908,016

WATER JET MASSAGE APPARATUS AND METHOD

Merlin E. Thomsen, 16733 SE. Ankeny St., Portland, Oreg. 97233

Division of Ser. No. 17,216, Feb. 20, 1987, Pat. No. 4,751,919. This application Apr. 27, 1988, Ser. No. 186,802

Int. Cl.[4] H61H 9/00

U.S. Cl. 128—66 **8 Claims**

1. The method of massaging a body with pulsating jets of water, comprising:

(a) covering substantially the entire body with closely contacting flexible sheet of water-proof material, and

(b) directing pulsating jets of water against the sheet of water-proof material, whereby the pulsating jets of water are impacted against the body through the intervening sheet of water-proof material.

4,908,017

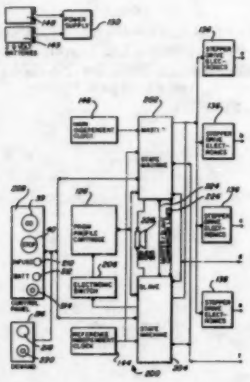
FAILSAFE APPARATUS AND METHOD FOR EFFECTING SYRINGE DRIVE

David C. Howson, Denver; Michael W. Fellinger, Boulder; John A. Popken, Longmont; Richard M. Altobellis, Lyons; Bennett J. Scharf, Boulder, and Walter E. Oshetski, Longmont, all of Colo., assignors to Ivion Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 734,028, May 14, 1985, abandoned. This application Jul. 31, 1987, Ser. No. 80,566

Int. Cl.[4] A61M 5/14

U.S. Cl. 604—67 **18 Claims**



1. A compact device for controlling delivery of fluid from a syringe having a piston the movement of which in a predetermined direction causes said fluid to be expelled from said syringe, said device comprising:

a stepper motor having a rotatable motor shaft;

pulse generating means including first and second state machines operating in parallel with respect to one another and connected in common with said stepper motor to provide pulses thereto, when said first and second state machines provide like outputs, for causing rotation of said motor shaft by increments, said first and second state machines including error monitoring means for monitoring said device to determine error in delivery of fluid from said syringe and precluding application of pulses to said stepper motor when said error is determined by said error monitoring means to thereby enhance safe delivery of fluid from said syringe; and

motion translation means connected with said motor shaft and adapted to be connected with said piston for causing movement of said piston in said predetermined direction in response to said incremental rotation of said motor shaft.

4,908,018

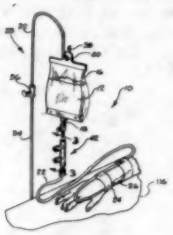
METHOD AND APPARATUS FOR INJECTING FLUIDS INTO AN IV LINE

John Thomsen, 1749 Bay Shore Rd., Nokomis, Fla. 34275

Continuation-in-part of Ser. No. 66,083, Jun. 24, 1987, abandoned. This application Sep. 29, 1988, Ser. No. 251,466

Int. Cl.[4] A61M 37/00

U.S. Cl. 604—83 **5 Claims**



1. An assembly for use in creating a flow of solution through tubing to establish an IV line from a supply of solution to a patient during an operation and for allowing the selective injecting of supplemental fluid under pressure into the flow of solution, the assembly comprising:

a manifold including a connector having a first end and a second end couplable with a length of tubing intermediate its length and having a cylindrical bore extending therethrough, the manifold also including riser means extending radially from the connector with each riser means having a bore extending therethrough in fluid communication with the bore of the connector; and

a check valve operatively associated with the riser means with each check valve including a body positioned adjacent to the radially exterior end of the riser means and having a cylindrical bore extending therethrough in fluid communication with the bore of its associated riser means and the connector, each body being formed for the support of a syringe in order to facilitate the flow of supplemental fluid under pressure, each check valve also including a poppet positioned between its associated body and riser means to seal the bore of the body for precluding the flow of supplemental fluids therethrough and, upon the application of the pressure of supplemental fluid from a syringe, to resiliently displace the poppet, to unseal the bore of the body and to thereby allow the flow of supplemental fluid from the syringe to the solution flowing through the connector and to the patient, each poppet having an upper imperforate cap and lower depending

legs, the legs being formed as a discontinuous cylinder for buckling under the application of pressure from fluid to be passed therethrough, the legs including slots and apertures with axial and radial portions

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4,908,019

APPARATUS COMPRISING DUAL RESERVOIRS FOR PARENTERAL INFUSION OF FLUID CONTAINING BENEFICIAL AGENT

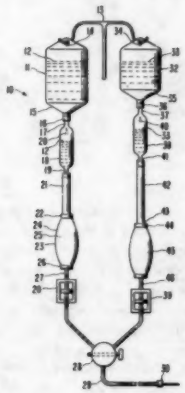
John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 14,910, Feb. 13, 1987, abandoned, which is a continuation of Ser. No. 547,110, Oct. 31, 1983, Pat. No.

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—85 **2 Claims**



1. A parenteral delivery system for administering a beneficial parenteral agent formulation to an animal, the parenteral system comprising:

(a) a primary reservoir comprising a parenterally administrable fluid;

(b) a formulation chamber in communication with the primary reservoir, the formulation chamber comprising:

(1) a wall comprising a composition impermeable to the passage of fluid, which wall surrounds an internal space;

(2) an inlet in the wall adapted for receiving a tube for letting fluid from the primary reservoir into the formulation chamber;

(3) an outlet in the wall adapted for receiving a tube for letting fluid the formulation chamber;

(4) an agent delivery device in the formulation chamber, the delivery device comprising:

(i) an inner mass transfer conductor;

(ii) a beneficial agent formulation dispersed in the mass transfer conductor; and,

(iii) a wall that surrounds the mass transfer conductor, the wall comprising a member selected from the group consisting of a diffusional composition and a microporous composition, which wall is a release rate controlling composition for the beneficial agent;

(c) a secondary reservoir comprising a parenterally administrable fluid;

(d) a formulation chamber in communication with the secondary reservoir, the formulation chamber comprising:

(5) a wall comprising a composition impermeable to the passage of fluid which wall surrounds an internal space;

(6) an inlet in the wall adapted for receiving a tube for letting fluid from the secondary reservoir into the formulation chamber;

(7) an outlet in the wall adapted for receiving a tube for letting fluid leave the formulation chamber;

(8) an agent delivery device in the formulation chamber, the delivery device comprising:

(iv) an inner mass transfer conductor;

(v) a beneficial agent dispersed in the mass transfer conductor;

(vi) a wall that surrounds the mass transfer conductor, the wall comprising a member selected from the group consisting of a diffusional composition and a microporous composition, which wall is a release rate controlling composition for the beneficial agent;

(e) a common path in communication with the primary reservoir and in communication with the secondary reservoir for administering the beneficial agent formulation to the animal; and,

(f) wherein when the parenteral delivery system is in operation, the fluid flows in the system to the animal at a parenterally therapeutically acceptable rate.

4,908,020

SELF-DESTRUCTIVE NON-REUSABLE INJECTION SYRINGE

Tor-Erling Pettersen, Bjornemyr, Norway, assignor to I.D. International A/S, Oslo, Norway

Filed Sep. 1, 1988, Ser. No. 239,560

Claims priority, application Norway, Sep. 15, 1987, 873863; Dec. 15, 1987, 875234

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—110 **6 Claims**

1. A self-destructive non-reusable syringe comprising a cylinder with a needle in one end and a plunger head positioned to slide within the cylinder and connected to a plunger shaft by a release mechanism comprising a steering knob carrier rotatably attached to the plunger shaft and having at least one steering knob which runs in a track along the exterior of a protrusion from the plunger head, which track comprises first and second sections, each of which sections is of approximately equal width, the first of which sections runs toward the plunger head along an angle relative to the longitudinal axis of the syringe and the second of which sections runs away from the plunger head substantially along the longitudinal axis of the syringe to an opening, for allowing the plunger head to be drawn from an initial position first away from the needle and then toward the needle and ultimately disengaging the plunger shaft from the plunger head if the plunger shaft is drawn away from the needle for a second time.

4,908,021

FLASHBACK CHAMBER FOR CATHETER ASSEMBLY

Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Continuation of Ser. No. 621,107, Jun. 15, 1984, abandoned.
This application Feb. 24, 1986, Ser. No. 832,134
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—168 15 Claims

1. An improved flashback structure of the type primarily designed for use with a catheter, said structure comprising:

(a) a main body portion structured to include an elongated cavity on the interior thereof, said cavity defining a path of fluid flow extending along the length thereof,

(b) said main body portion comprising a bottom side and a top side disposed in spaced, parallel relation to one another and extending the length of said cavity in enclosing relation to said cavity and said path of fluid flow therein,

(c) a slidable member having an elongated configuration and movably mounted on said main body portion in parallel relation to said top side and disposed in overlying relation to said top side and further disposed to define a space between said slidable member and said top side,

(d) an elongated hollow needle secured to and extending outwardly from said main body portion and including a sharpened distal end, said needle including a proximal end mounted in fluid communication with said path of fluid flow,

(e) a chamber maze formed in said cavity and comprising a plurality of successively disposed chambers positioned along the length of and at least partially defining said path of fluid flow; said plurality of chambers extending from one end of said cavity adjacent said proximal end of said needle to a distal end of said cavity,

(f) a vent means for venting air from said cavity and including a vent chamber disposed at said distal end of said cavity and defining an endmost chamber of said plurality of chambers and disposed and structured on said main body portion for fluid communication with said path of fluid flow,

(g) said vent means comprising a vent disk formed of gas only permeable material, whereby liquid may not pass therethrough, said disk element mounted in said vent chamber in fluid communication with said path of fluid flow,

(h) said vent means further comprising an aperture means integrally formed in said top side in aligned and fluid communicating relation with said disk element, said aperture means disposed to establish fluid communication between said vent disk and said space between said slidable member and said top side, said space disposed in communicating relation with the exterior of said main body portion,

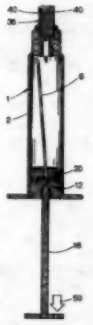
(i) said vent means cooperatively structured and disposed relative to said cavity to force air to be vented from said cavity successively through said vent chamber, said vent disk, said aperture means and said space between said slidable member and said top side, as blood enters said chamber maze at said one end of said cavity.

4,908,022

DISPOSABLE SAFETY SYRINGE HAVING A RETRACTABLE NEEDLE CANNULA AND CANNULA LOCK

Terry M. Haber, El Toro, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Aug. 15, 1988, Ser. No. 232,234
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—195 20 Claims



1. A syringe comprising:

a hollow cylinder having proximal and distal ends and containing a supply of fluid to be administered to a patient;

a double ended hypodermic needle cannula, a first end of said cannula extending into the interior of said cylinder, and the opposite end of said cannula extending outwardly from said cylinder for administering an injection;

means for supporting said cannula at the distal end of said cylinder;

a plug located at a relatively distal position within said cylinder so as to be separated from the first end of said cannula;

a piston located at a relatively proximal position within said cylinder in spaced axial alignment with said plug, whereby the fluid of said cylinder is received in the space between said plug and piston, said piston being movable distally through said cylinder and towards said plug for causing a corresponding distal movement of said plug, such that the first end of said cannula penetrates said plug and communicates with the fluid between said plug and said piston, and

sealing means to form an air-tight seal between said piston and said plug to thereby fixedly attach said piston to said plug after said piston has been moved distally through said cylinder and into contact with said plug.

4,908,023

SYRINGE ASSEMBLY

Frank Yuen, 110-20 71st St., Forest Hills, N.Y. 11375

Filed Aug. 15, 1988, Ser. No. 232,014
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—118 3 Claims

1. A syringe assembly comprising:

a hollow barrel;

a plunger means mounted within said barrel;

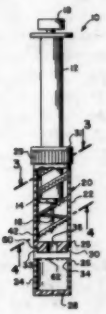
a hypodermic needle having a first end fixedly secured to and in communication with said barrel and having a free end for the discharge of material therefrom upon downward movement of said plunger within said barrel;

a hollow cylindrical sheath mounted to the barrel and extendable from a first retracted position exposing said hypodermic needle to a second position substantially covering said hypodermic needle;

ratchet means including a continuous row of regularly

spaced and aligned outwardly extending teeth formed on the external surface of said barrel and extending longitudinally thereon wherein said ratchet means extending longitudinally on said barrel follows a spiral path around the external cylindrical surface of said barrel; and

locking pawl means extending radially inwardly from an inner cylindrical surface of said sheath, said locking pawl means operatively coupled to said outwardly extending



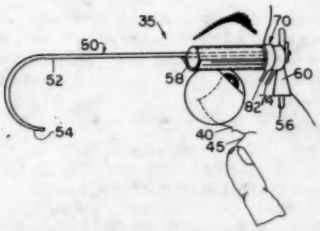
teeth formed on the external surface of said barrel such that, upon movement of said sheath from said first retracted position to said second position, said locking pawl means continuously engages and slides over said teeth permitting movement of said sheath from said first position to said second position while movement from said second position to said first position is prevented by the continuous engagement of said locking pawl means with said outwardly extending teeth of said ratchet means.

4,908,024

OCULAR SELF-TREATMENT APPARATUS AND METHOD

Py: Daniel, 22 Fernel. ff Ter., Short Hills, N.J. 07078

Filed May 4, 1988, Ser. No. 188,331
Int. Cl.[4] A61M *7/00*
U.S. Cl. 604—300 **23 Claims**



1. A device for the self-administration of ocular treatment material, comprising:

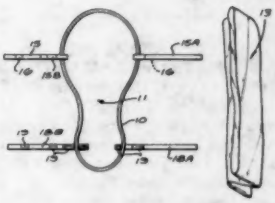
a frame, deviation means for deviating the visual axis including at least one prism positioned on the frame so that a user would rotate his eye upwards when using the device, and dispenser means for storing and dispensing ocular treatment material to the eye area, supported by the frame.

4,908,025

BODY WASTE RECEPTOR FOR BED PATIENTS

Joseph W. Ketchum, Jr., 13751 St. Andrews Dr., Seal Beach, Calif. 90740

Filed May 9, 1986, Ser. No. 861,586
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—327 **8 Claims**



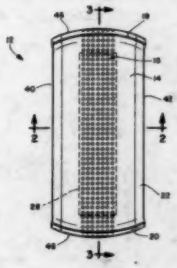
1. An appliance for use on a bed confined patient reclining in a side posture, in place of a bed pan, comprising a semi-rigid generally oval frame having an upper portion shaped to lie closely adjacent the rear of the waist of a person and a lower portion shaped to lie closely adjacent the rear of the thighs of such person and having an open interior, means for removably attaching to said frame a disposable bag, and means for releasably connecting said frame, together with a bag attached thereto, to the rear of the waist and thighs of a person comprising a first belt means carried by said upper portion of said frame, for encircling the waist of such person, and a second belt means carried by said lower portion of said frame for encircling the thighs of such person between the knees and crotch, whereby, when the appliance is so attached, raising of the person's knees will press the said upper portion of said frame more closely against the rear of such person.

4,908,026

FLOW DISTRIBUTION SYSTEM FOR ABSORBENT PADS

Corrine A. Sukiennik, Neenah, Wis., and Mollie M. Becker, Loreto B.C.S., Mexico, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 22, 1986, Ser. No. 945,934
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 **22 Claims**



1. An absorbent article comprising:

(a) a liquid pervious liner designed to be positioned adjacent to the body of a wearer, said liner having a plurality of perforations extending completely therethrough which are arranged in a central area and spaced away from the longitudinal side edges thereof;

(b) a liquid-impermeable backing member;

(c) absorbent means for absorbing body fluids positioned between said liner and said backing member; and

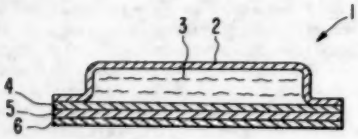
(d) flow zone control means for facilitating dispersion of body fluid along the length thereof before allowing said fluid to pass into said absorbent, said flow zone control means being positioned between said central area of said liner and said absorbent means, and said flow zone control means has a coefficient of friction with said liner of between about 0.7 and 1.1.

4,908,027

SUBSATURATED TRANSDERMAL THERAPEUTIC SYSTEM HAVING IMPROVED RELEASE CHARACTERISTICS

David J. Enscore, Sunnyvale; Patricia S. Campbell, Palo Alto; James L. Osborne, Mountain View; Melinda K. Smart, Sunnyvale, and Su I. Yum, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Sep. 12, 1986, Ser. No. 906,730
Int. Cl.[4] A61K *9/00*
U.S. Cl. 604—890.1 **29 Claims**



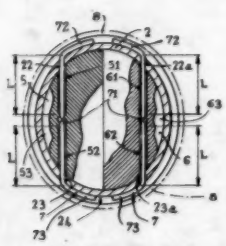
1. A method of producing a therapeutic effect which comprises placing a source of benztropine comprising a benztropine base permeable material having benztropine dissolved therein in benztropine transmitting relationship to an area of intact human skin and administering benztropine to the human subject from said source through said area of intact skin for an extended period of time at a therapeutically effective rate of approximately 10–40 μg/hr for a substantial portion of said extended period of time.

4,908,028

VALVE INCORPORATING AT LEAST ONE ROCKING FLAP WITH RESPECT TO ELASTIC PIVOTS

Jean Colon, 3 Rue des Ecoles, Saint-Jean-en Royans, France 26190 , and Pierre Marion, Tour Carré Chemin de l'ancienne Eglise, Poleymieu Neuville-sur-Saône, France 69250

Filed Mar. 17, 1988, Ser. No. 169,590
Claims priority, application France, Mar. 20, 1987, 87 04107
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **11 Claims**



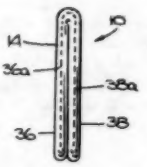
1. A valve for a valvular heart prosthesis comprising a ring member defining an opening having a first central axis extending centrally of said opening so as to be generally perpendicular to said ring member, at least one flap for selectively closing and opening said opening through said ring member, said flap having an outer periphery which is separate from said ring member, at least one elongated torsion member pivotally mounting said at least one flap to said ring member, said torsion member having inner and outer portions and an intermediate portion therebetween, said outer portion being fixedly secured to said ring member, said inner portion being spaced inwardly of the periphery of said flap, and being fixedly secured to said flap, said flap being pivotally moveable from a first position in which said flap extends generally across said opening defined by said ring member to thereby obstruct said opening to a second position generally parallel to said first axis thereof, said torsion member having a single elongated axis along said outer portion, said intermediate portion and said inner portion and exhibiting an elastic moment of force about said elongated axis when said intermediate portion is twisted about said elongated axis as said flap is pivoted relative to said ring member, said moment of force of said intermediate portion of said torsion member thereby urging said flap to return to said first position after said flap is pivoted therefrom.

4,908,029

FLEXIBLE NEEDLE STOP

Jeffrey E. Bark, and Keith A. Young, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Apr. 25, 1989, Ser. No. 343,098
Int. Cl.[4] A61F *2/12*
U.S. Cl. 623—8 **36 Claims**



1. An implantable prosthesis comprising:

a. a tissue expander shell defining an internal chamber infusible with fluid, said shell being substantially flexible and substantially foldable when said chamber is substantially empty, said shell having a needle penetrable portion for permitting entry of an infusion needle into said internal chamber for infusion of fluid in said internal chamber,

b. a needle impenetrable needle stop disposed within said shell, said needle stop having a predetermined shape and size, and a normally unfolded condition, said needle stop being flexible and foldable to permit manual flexion and folding of said needle stop and said shell when said internal chamber is substantially empty, said needle stop being positioned within said shell in a predetermined orientation with respect to said shell to stop said infusion needle from progressing in a predetermined direction outwardly of said shell after said infusion needle has entered said internal chamber.

4,908,030

METHOD OF MANUFACTURING SYNTHETIC BONE COATED SURGICAL IMPLANTS

Leonard I. Linkow, New York, N.Y.; Anthony J. Armini, Bedford, Mass., and Anthony W. Rinaldi, Philadelphia, Pa., assignors to Vent-Plant Corporation, Inc., Philadelphia, Pa.

Filed Apr. 29, 1987, Ser. No. 43,908
Int. Cl.[4] A61F *2/28*; C23C *14/46*
U.S. Cl. 623—16 **15 Claims**

1. A process for manufacturing hydroxylapatite-coated implants comprising the steps of:

obtaining an implant material suitable for implantation into an animal,

ion beam sputter coating said implant material with hydroxylapatite by directing a Xenon ion beam operated at at least 10 kev energy against a hydroxylapatite target positioned such that hydroxylapatite ions kicked off of the target strike the implant material,

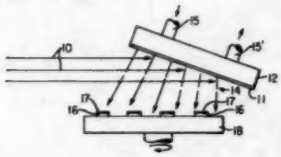
conducting said ion beam sputter coating under a vacuum of at least 10^{-4} torr in the presence of a preselected amount of a molecular oxygen-containing gas,

recovering said hydroxylapatite-coated implant

annealing said hydroxylapatite-coated implant in a vacuum at a pressure of at least 10^{-4} torr from about 1 hour to about 24 hours at a temperature ranging between about 300° C. and about 900° C., and

recovering a completely recrystallized hydroxylapatite-coated implant.

14. A hydroxylapatite-coated implant, suitable for implantation into an animal in need of such treatment, manufactured by a process comprising the steps of:



obtaining an implant suitable for implantation into an animal,

ion beam sputter coated said implant with hydroxylapatite by directing a Xenon ion beam operated at at least 10 kev energy against a hydroxylapatite target positioned such that hydroxylapatite ions kicked off of the target strike the implant,

conducting said ion beam sputter coating under a vacuum of at least 10^{-5} torr in the presence of a preselected amount of a molecular oxygen containing gas,

recovering said hydroxylapatite coated implant,

annealing said hydroxylapatite-coated implant in a vacuum at a pressure of at least 10^{-4} torr for from about 1 hour to about 24 hours at a temperature ranging between about 300° C. and about 900° C., and

recovering said hydroxylapatite-coated implant, the hydroxylapatite coating being fully dense, crystalline and substantially the same in terms of percentages of phosphorous and calcium as natural hydroxylapatite.

4,908,031

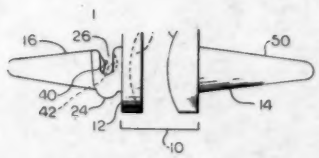
TOE IMPLANT

Eldon E. Frisch, Midland, assignor to Dow Corning Wright, Arlington, Tenn.

Filed Jul. 27, 1989, Ser. No. 385,619

Int. Cl.[4] A61F *2/42*

U.S. Cl. 623—21 **4 Claims**



1. An improved prosthetic toe joint adapted for replacement of a human toe joint which includes at least one one-piece member for implantation into the bone of the joint, the implant having a stem and an enlarged head which is provided with a concave articulating surface for articulation against another one-piece component having a mating convex surface or against a mating convex bone surface, the one part component being provided with a flexible hinge section at the junction of its stem and the enlarged head portion, the hinge section being formed from a section of the stem which extends laterally outwardly on both sides of the stem portion adjacent the junction with the head, the laterally enlarged section being provided with a longitudinal channel extending through its midsection to form a hinge, said one-piece component being formed of a flexible elastomeric, physiologically inert material.

4,908,032

RECONSTRUCTION PROSTHESIS

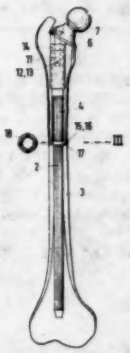
Arnold Keller, Kayhude, Fed. Rep. of Germany, assignor to Waldemar Link GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Mar. 2, 1988, Ser. No. 163,093

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1987, 8703491

Int. Cl.[4] A61F *2/30*

U.S. Cl. 623—18 **8 Claims**



1. A hip prosthesis to be supported by a transverse subtrochanteric bone surface located intermediate upper and lower portions of the femur bone, comprising:

a stem having upper and lower portions, for positioning longitudinally within respective upper and lower portions of the femur bone;

support means associated with the stem to extend transversely from the stem and between the upper and lower bone portions, the support means having upper and lower bone engaging surfaces and an external diameter sized to be substantially no larger than the external diameter of the bone portions, the lower bone engaging surface being adapted to transfer longitudinal forces from the upper portion of the stem through said bone surface to the lower bone portion, and to define with said upper bone engaging surface a plurality of interspaces for bone growth between the upper and lower bone portions.

4,908,033

HIP JOINT ACETABULUM

Otto Frey, Winterthur, and Rudolf Koch, Berlingen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 8, 1988, Ser. No. 204,108

Claims priority, application Switzerland, Jul. 9, 1987, 2607/87

Int. Cl.[4] A61F *2/34*

U.S. Cl. 623—22 **17 Claims**

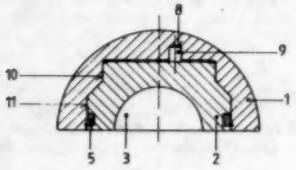
1. A hip joint acetabulum comprising

an outer bowl of non-deformable material having an inwardly directed annular groove;

an acetabular body of non-deformable material disposed

within said bowl, said body having a cavity for receiving a joint head of a femur prosthesis and an outwardly directed annular groove;

a split ring of synthetic material disposed in said groove of



said body and having an annular lug projecting radially outwardly from a minor circumferential periphery of said ring into said groove of said bowl to secure said body to said bowl, said lug being detachable from the remained of said ring to permit removal of said body from said bowl.

4,908,034

ENDOPROSTHETIC BONE JOINT COMPONENTS

Barry O. Weightman, Thames Ditton, and Robert A. Wordsworth, Bickley, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 940,164, Dec. 9, 1986, abandoned, which is a continuation of Ser. No. 676,282, Nov. 29, 1984, abandoned. This application Feb. 23, 1989, Ser. No. 314,285

Claims priority, application United Kingdom, Dec. 1, 1983, 8332119

Int. Cl.[4] A61F *2/30, 2/36*

U.S. Cl. 623—23 **5 Claims**

1. A method of producing an endoprosthetic bone component, comprising:

providing three parts, two such parts being of material non-deformable under patient body load, and the third such part being of plastics material deformable under such load;

forming one of said two parts with a cavity and the other of said two parts with a projection, said cavity and projection being configured to be engageable in a mutual a non-wedging clearance fit to define therebetween a space of cup shape having uniform wall thickness;

forming said third part to said cup shape;

assembling said component by engaging said cavity and projection to form said space, and locating said third part therebetween in said space in direct engagement with said cavity and projection; and

subjecting said assembled component to said load to engage said cavity and projection further to force said third part plastics material by deformation towards complete accommodation with the surfaces of said cavity and projection thereby to lock by a non-wedging interference fit, absent any other action on, by and between, said two parts, against mutual articulation;

said wall thickness being sufficiently small to inhibit ejection of said plastics material by creep under said load.

4,908,035

PROSTHESIS FOR A HIP JOINT

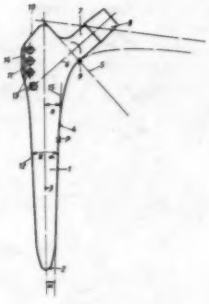
Andre G. Deckner, Paris, France; Martin Imhof, Rotkreuz, Switzerland, and Karl Zweymuller, Vienna, Austria, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 32,329, Mar. 30, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 262,882

Claims priority, application Switzerland, Apr. 3, 1986, 1302/86-2

Int. Cl.[4] A61F *2/34*

U.S. Cl. 623—23 **3 Claims**



1. A prosthesis for a hip joint comprising

a neck; and

a blade having a distal section of conical shape extending along a longitudinal axis on a predetermined conical angle and a proximal section connected to said neck along a boundary plane disposed in angular relation to said longitudinal axis, said proximal section having a medial narrow side extending on a hyperbolic arc from a first point on said distal section to a second point on said boundary plane, said hyperbolic arc having a vertex at said second point whereby said medial side is adapted to a course of a calcar arc to avoid butting of said blade against a distal end of a calcar and wherein a tangent to said hyperbolic arc at said first point forms an angle with said longitudinal axis equal to one-half of said conical angle.

4,908,036

ENDOPROSTHESIS

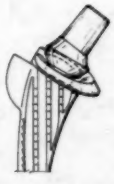
Helmut D. Link, Hamburg, and Arnold Keller, Kayhude, both of Fed. Rep. of Germany, assignors to Waldemar Link GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed May 31, 1988, Ser. No. 200,758

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1987, 8708419[U]

Int. Cl.[4] A61F *2/36, 2/28, 2/30, 2/32*

U.S. Cl. 623—23 **9 Claims**



1. Endoprosthesis for insertion into a bone cavity as a replacement of a bone part, comprising:

a stem having anterior, posterior, medial and laceral sides, said stem including a lower portion which is to be an-

chored in the bone cavity and an upper portion which is to project out of the cavity;

first holding means formed in the stem upper portion; and

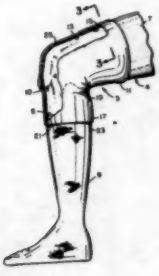
a separate bone support collar which extends transversely to the stem having a distal surface for engaging a resected surface of the bone and a proximal surface having second holding means formed therein for pivotally mounting the bone support collar to the first holding means of said stem upper portion, for the duration of the implantation.

4,908,037

SUSPENSION PROSTHETIC SLEEVE FOR RIGOROUS ACTIVITY

Michael R. Ross, 2021 Sheridan Rd., Leucadia, Calif. 92024

Filed Sep. 16, 1988, Ser. No. 245,361
Int. Cl.[4] A61F 2/78
U.S. Cl. 623—32 **17 Claims**



1. A prosthetic sleeve for retaining a prosthesis to a residual limb, comprising:

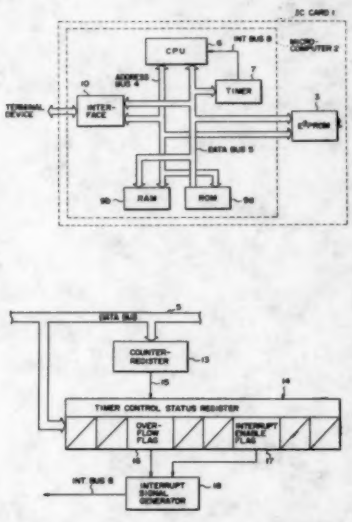
a sleeve of a diameter equal to or less than the circumference of the limb made of an air impermeable elastomeric material, further comprising a first end of said sleeve which may be stretched around the prosthesis and engage the prosthesis creating a substantially air tight seal therebetween, and comprising a second end of said sleeve defining an irregular and continuous inside surface means for sealing said sleeve, wherein said second end may be stretched around the limb so that said irregular and continuous surface means positively and mechanically displaces skin of the limb creating a substantially air tight seal sufficient to retain the limb to the prosthesis by atmospheric pressure.

4,908,038

HIGH-SECURITY INTEGRATED-CIRCUIT CARD

Hidekazu Matsumura, Okegawa, and Yoshikazu Yorimoto, Tokyo, both of Japan, assignors to Toppan Printing Co., Ltd, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,267
Claims priority, application Japan, Oct. 29, 1987, 62-273866
Int. Cl.[4] G06F 9/00
U.S. Cl. 902—5 **8 Claims**



1. An high security integrated-circuit card having a micro computer for executing a processing command received from an external device and returning a processing result to said external device, said integrated-circuit card comprising:

timer means for measuring elapsed time after reception of a processing command from said external device, and generating an output signal when the measured time reaches a predetermined value; and

return means for returning said processing result to said external device in response to said output signal, whereby said processing result is returned to said external device in response to the elapsed time measured by said timer means having reached a predetermined value irrespective of the actual processing time required to obtain said processing result.

4,908,039

BUILT PARTICULATE DETERGENT CONTAINING A NARROW RANGE ALCOHOL ETHOXYLATE AND A PET-POET COPOLYMER SOIL RELEASE AGENT

Richard J. Holland, Trenton, and Charles Buda, Middlesex, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Filed Aug. 10, 1987, Ser. No. 84,524

The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[4] C11D *1/72, 3/37, 11/00;* D06M *15/507*

U.S. Cl. 8—137 13 Claims

1. A soil release promoting built particulate detergent composition of improved soil release promoting properties in cold water washing of polyester-containing fabrics that had been soiled with oily soils, which improved soil release is due to the presence therein of narrow range ethoxylate (NRE) nonionic detergent and soil release promoting polyethylene terephthalate-polyoxyethylene terephthalate (PET-POET) copolymer instead of broad range ethoxylate (BRE) nonionic detergent and PET-POET copolymer, which comprises 10 to 35% of NRE nonionic detergent which is a C_{12-14} higher fatty alcohol narrow range ethoxylate nonionic detergent in which over 85% of the ethylene oxide content that is present in the NRE is present as polyethoxy groups of 5 to 10 moles of ethylene oxide per mole of such NRE, 30 to 75% of builder for the NRE, and 0.5 to 10% of soil release promoting PET-POET copolymer of weight average molecular weight in the range of 15,000 to 50,000 in which the polyoxyethylene is of a molecular weight in the range of 1,000 to 10,000.

4,908,040

ANIONIC CYCLODIYLIDE COMPOUNDS, THEIR PREPARATION AND USE IN WASHING AGENTS AS SHADING DYES

Rudolf Naef, Lupsingen, Switzerland, and Claude Eckhardt, Riedisheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

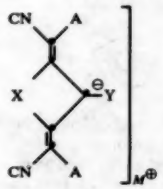
Filed Oct. 28, 1987, Ser. No. 113,311

Claims priority, application Switzerland, Nov. 7, 1986, 4454/86

Int. Cl.[4] C09B *23/00;* D06M *1/18*

U.S. Cl. 8—137 6 Claims

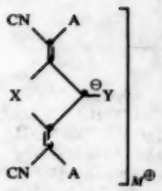
1. A method of bluing fabrics, which method comprises applying an aqueous washing composition which contains an effective amount of a bluing compound of the formula



(Ic)

in which X is substituted or unsubstituted, 5- and/or 6-membered monocyclic or polycyclic aromatic radical, Y is a substituted or unsubstituted 5- or 6-membered monocyclic or polycyclic aromatic radical, M is an alkali metal or an ammonium ion, A is CN as shading dye.

6. A solid or liquid washing agent which comprises between 0.0025 to 0.01% of an anionic cyclodiylide compound of the formula



(Ic)

in which X is a substituted or unsubstituted, 5- and/or 6-membered monocyclic or polycyclic aromatic radical, Y is a substituted or unsubstituted 5- or 6-membered monocyclic or polycyclic aromatic radical, M is an alkali metal or an ammonium ion, A is CN as shading dye.

4,908,041

NAVY AND BLACK DYE MIXTURES: THIOPHENE AZO DISPERSE DYE AND RED, YELLOW OR ORANGE DISPERSE DYE

Erwin Hahn, Heidelberg; Guenter Hansen, Ludwigshafen; Karl-Heinz Etzbach, Frankenthal; Helmut Reichelt, Neustadt; Ernst Schefczik, Ludwigshafen; Helmut Degen, Frankenthal; Reinhold Krallmann, Weisenheim, and Gerhard Wagenblast, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

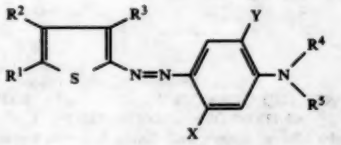
Filed Oct. 13, 1988, Ser. No. 256,997

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734586

Int. Cl.[4] C09B *29/03, 67/22*

U.S. Cl. 8—638 4 Claims

1. A navy or black dye mixture containing one or more thiophene-azo dye of the formula



where

R^1 is formyl, cyano or phenylsulfonyl,

R^2 is halogen, C_1–C_8-alkoxy, substituted or unsubstituted phenoxy, C_1–C_6-alkylthio, phenylthio, C_1–C_4-alkylsulfonyl or phenylsulfonyl,

R^3 is cyano, C_1–C_6-alkoxycarbonyl whose alkyl chain may be interrupted by one or more oxygen atoms, carbamoyl or C_1–C_4-mono- or dialkyl-carbamoyl,

R^4 and R^5 are identical or different and each is independently of the other C_1–C_4-alkyl which may be substituted by hydroxyl, C_1–C_4-alkoxy, cyano, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyloxy or C_1–C_4-alkylaminocarbonyloxy,

X is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or the radical —NH—CO—R^6 where R^6 is C_1–C_4-alkyl, which may be substituted by C_1–C_4-alkoxy, phenoxy, cyano, hydroxyl, chlorine or C_1–C_4-alkanoyloxy, or is unsubstituted or C_1–C_4-alkoxy-substituted phenoxy, and

Y is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, and

one or more dye F whose adsorption maximum is at a wavelength of from 390 to 520 nm, wherein the proportion of thiophene-azo dye is from 60 to 99% by weight and the proportion of dye F is from 1 to 40% by weight, based on the total weight of thiophene-azo dye and dye F in the mixture and wherein said dye F is a member of a class selected from the group consisting of monoazo dyes, disazo dyes, anthraquinone dyes, methine dyes, quinop-

thalones, naphtholactam dyes, coumarin dyes, and diphenylamine dyes.

4,908,042

PROCESS FOR COLORING CELLULOSE ON POLYESTER WITH WATER-INSOLUBLE RED MONO-AZO DYES

Ulrich Bühler, 8, Kastanienweg, 8755 Alzenau; Manfred Hähnke, 13, Behringstrasse, 6233 Kelkheim; Michael Kunze, 1A, Platanenweg, 6238 Hofheim-Marxheim, and Albert Bode, 1, Finkenweg, 6231 Schwalbach, all of Fed. Rep. of Germany

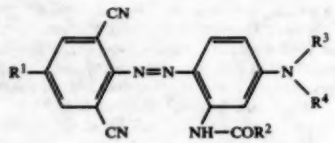
Division of Ser. No. 11,103, Feb. 5, 1987, Pat. No. 4,769,449, which is a continuation of Ser. No. 839,379, Mar. 14, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,419

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511728

Int. Cl.[4] D06P *3/42, 3/48, 3/54;* **C09B** *29/085*

U.S. Cl. 8—639 **1 Claim**

1. A process for dyeing or printing high-molecular polyester by applying thereto one or more dyes of the formula



wherein

R^1 is methyl;

R^2 is ethyl or n-propyl;

R^3 is methylcarbonyloxyethyl or ethylcarbonyloxyethyl;

R^4 is one of the definitions of R^3.

4,908,043

METHOD OF PRODUCING CRYSTALS OF ANHYDROUS SODIUM SULFIDE

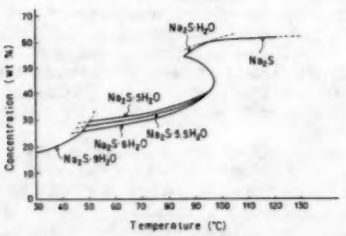
Kannosuke Maeda, Ashiya, and Toshio Aoyama, Kyoto, both of Japan, assignors to Sankyo Kasei Co., Ltd., Osaka, Japan

Filed Jun. 23, 1988, Ser. No. 210,463

Claims priority, application Japan, Jul. 23, 1987, 62-185277

Int. Cl.[4] C01D *1/30;* **C01B** *17/00*

U.S. Cl. 23—302 T **4 Claims**



1. A method of producing anhydrous sodium sulfide in the form of hexagonal isometric crystals having a purity of 97.6% or more, which comprises maintaining an aqueous solution of sodium sulfide containing from about 2 to about 25% by weight of NaOH at a temperature of 97° C. or higher for at least 1 hour, and then concentrating the solution at a temperature of 97° C. or higher to precipitate the anhydrous sodium sulfide crystals from the solution.

4,908,044

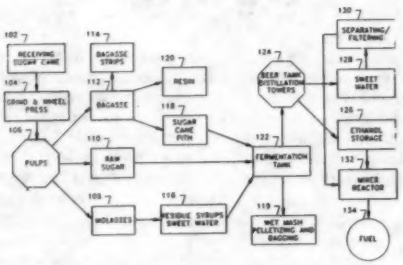
SEMI SOLID ETHANOL BASED FUEL

Trueman A. Brungardt, Loveland, Colo., assignor to T.A.V., Inc., Greeley, Colo.

Filed Apr. 25, 1989, Ser. No. 342,745

Int. Cl.[4] C10L *7/00*

U.S. Cl. 44—7.6 **10 Claims**



1. A semi-solid fuel comprising in combination:

86.1% by weight ethanol:

2.2% by weight water; and,

11.7% by weight sodium salt of fatty acids.

4,908,045

ENGINE CLEANING ADDITIVES FOR DIESEL FUEL

David H. Farrar, Scarborough, Canada, assignor to Velino Ventures, Inc., Thornhill, Canada

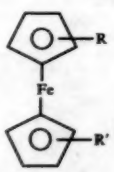
Filed Dec. 23, 1988, Ser. No. 289,622

Int. Cl.[4] C10L *1/14*

U.S. Cl. 44—68 **12 Claims**

1. A method for reducing particulate emissions from a diesel engine without measurably increasing NO_x emissions from said diesel engine, said method comprising:

(i) burning a fuel oil in said diesel engine in the presence of excess air, the fuel oil containing a compound selected from the group consisting of ferrocene, and derivatives of ferrocene represented by

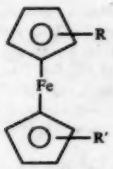


wherein each R and R', independent of the other is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl or heterocyclic functional groups, said compound present in an amount between 0.01 ppm and 1.0 ppm based on iron molecules present in said compound.

7. For use in an internal combustion diesel engine, a fuel composition capable of burning with reduced particulate emissions while maintaining the NO_x emissions at an essentially stable level, the fuel composition comprising:

(i) a fuel oil; and

(ii) a compound selected from the group consisting of ferrocene and derivatives of ferrocene represented by the formula:



wherein each of R and R', independent of the other, is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl or heterocyclic functional groups, said compound present in an amount between 0.01 ppm and 1.0 ppm based on iron molecules present in said compound.

4,908,046

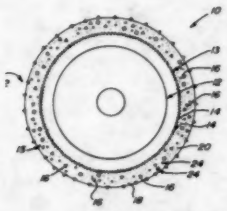
MULTILAYER ABRADING TOOL AND PROCESS

Ronald C. Wiand, 18500 Fairway Dr., Detroit, Mich. 48221

Filed Feb. 14, 1989, Ser. No. 310,783

Int. Cl.[4] B24D *3/02*

U.S. Cl. 51—293 **10 Claims**



1. A process for infiltrating a multilayer abrasive grit structure onto an abrading tool-comprising the steps of:

(a) providing an abrading tool substrate;

(b) mixing preselected quantities of an infiltrant and an abrasive grit material to form an abrasive grit coating

applying said abrasive grit coating to said structured substrate such that said abrasive grit is suspended in said coating in a multilayer; and

heating said structured substrate having said abrasive grit coating applied thereto for a time and at a temperature for infiltration of said abrasive grit, thereby attaching a multilayer of said abrasive grit to said structured substrate

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4,908,047

SOOT REMOVAL FROM EXHAUST GAS

Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Filed Oct. 9, 1987, Ser. No. 107,721

Int. Cl.[4] B03C *1/00*

U.S. Cl. 55—10 **17 Claims**

7. A method for removing soot from a diesel engine exhaust stream, comprising the steps of:

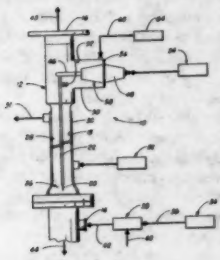
contacting the exhaust gas stream with water in a contact zone to produce a substantially water saturated exhaust gas stream;

electrically charging particles and droplets in the water saturated exhaust gas stream in an ionizing zone;

electrostatically attracting and de-entraining soot and soot containing water droplets from the gas stream containing electrically charged particles and droplets in a collection zone to produce a substantially soot free exhaust gas stream; wherein insulator means are operatively associated with the ionizing and collection zones, the method further comprising:

heating a fluid stream with the exhaust gas stream; and

passing the heated fluid stream generally near the insulator means for maintaining the temperature of the insulator means above the dew point of the gas stream containing electrically charged particles and droplets.



4,908,048

APPARATUS FOR DEGASSING LIQUIDS BY CENTRIFUGAL FORCE IN A FRUSTUM SHAPED BODY

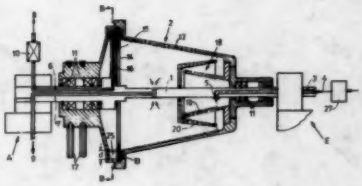
Hans Hofmann, Cologne; Herbert Broerken, Solingen, and Franz Hoffacker, Langenfeld, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 348,512, Feb. 12, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 563,550

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105914

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—193 **1 Claim**



1. In an apparatus for degassification of liquids having a rotatable body for receiving a liquid mounted around a fixed shaft having an internal passage for introducing the liquid into the body and associated with an annular chamber for collecting the liquid,

the novel combination of improvements in degassification of liquid suspensions and emulsions at reduced pressure being,

a rotatable body consisting of a frustum of a cone which is defined at a first end by a first base plane surface intersecting the axis of the body and at the opposite and second end by a second plane surface intersecting the axis of the body and of a lesser area than said first base plane surface,

said rotatable body being mounted around a fixed axially extending shaft,

and enclosing an interior of the body of progressively increasing diameter from the second plane surface to the first base plane surface and having an internal wall surface adapted to receive the liquid radially injectable to the wall surface from the shaft under reduced pressure,

a passage in the shaft positioned at the second end of the body and adapted to introduce the liquid via said passage into the rotatable body,

means positioned adjacent the second plane surface for the passage of the liquid from the passage in said shaft to the internal wall surface,

including means to apply the liquid onto a surface which rotates and for effecting a change of pressure on the liquid within a limited period of time to at least partially degassify the liquid, in passing to the internal wall surface, said means consisting of a sharp edged shutter adapted to restrict the liquid to be degassed,

said body and fixed shaft being so constructed and arranged that the liquid is receive on the internal wall surface of the rotatable body and the body is adapted to spread the liquid out under a reduced pressure so that the liquid forming a thin film on the internal surface under the influence of the centrifugal force may become even thinner on the internal wall surface and is degassed,

and being adapted to move the liquid under centrifugal force radially and axially along the internal wall surface at an acceleratable rate to an annular collecting chamber for collecting degassed liquid from the wall surface adjacent the first base plane surface,

and associated with said collecting chamber, recessed means extending into the collecting chamber for removing the degassed liquid,

whereby degassed liquid is drawn out of the apparatus against the reduced pressure in the body interior.

4,908,049
SPHERICAL CYCLONE

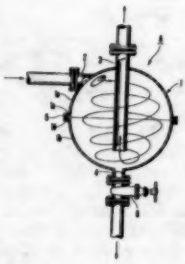
Yasunobu Yoshida, 1-25-8, Torigoe, Taito-ku, Tokyo, and Kazumitsu Karasawa, Tokyo, both of Japan, assignors to Yasunobu Yoshida, Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,668

Claims priority, application Japan, Sep. 17, 1987, 62-141977[U]

Int. Cl.[4] B04C *5/081*

U.S. Cl. 55—227 **10 Claims**



1. A cyclone for separating particles from particle-containing fluids comprising:

a substantially spherical housing having an upper portion and a lower portion and defining therewithin a separation chamber;

inlet means mounted to a peripheral surface of said upper portion for introducing particle-containing fluid into said separation chamber;

outlet means defined through said upper portion including an outlet pipe extending into said separation chamber and centrally through said separation chamber, said outlet pipe being non-perforate at least along the length thereof disposed in said upper portion and having an inlet opening defined in said lower portion of said spheric[illegible] housing; and

particle outlet means defined through the lower portion of said spherical housing.

4,908,050
OIL MIST REMOVER

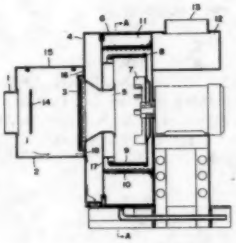
Tsuneo Nagashima, and Makoto Yamane, both of Osaka, Japan, assignors to Tabai Espec Co. Ltd.; Itoman & Co. Ltd., both of Osaka and Taichi Uchida, Kyoto, all of, Japan

Continuation of Ser. No. 237,238, Aug. 26, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 395,134

Claims priority, application Japan, Aug. 31, 1987, 62-218122; Aug. 31, 1987, 62-218127; Aug. 31, 1987, 62-133312[U]; Oct. 20, 1987, 62-265692

Int. Cl.[4] B01D *45/00*

U.S. Cl. 55—400 **6 Claims**



1. An oil mist remover which is for removing a mixture such as oil mist, etc, and used in purifying polluted air containing oil mist comprising:

a main body case having a door at one end and an exhaust hole at another end;

a straightening box which is provided on said door and provided with a suction hole;

a suction guide introducing said polluted air containing oil mist, which has been sucked in said straightening box through said suction hole, into said main body case through said door;

a baffle plate provided near said suction hole in said straightening box, said baffle plate obstructing said air from flowing straight;

a cylindrical rotary filter rotatably provided in said main body case so that air passing through said suction guide flows into said cylindrical rotary filter;

a cylindrical fixed filter fixedly provided in said main body case and around said rotary filter, said fixed filter being designed so that air passing through said rotary filter passes through said fixed filter;

a fan provided in said rotary filter and coaxially thereto, said rotary fan rotating together with said rotary filter;

a driving means driving said rotary fan and rotary filter so that said air containing oil mist is sucked into said main body case through said suction hole and then passes through said rotary filter and fixed filter into said exhaust hole;

a drain path introducing a drain containing oil collected in said straightening box into said door;

a drain chamber provided under said main body case and door and used commonly for them, said drain, which is collected in said main body case and door and contains oil therein, flowing into said drain chamber through holes provided in the bottom walls of said main body case and door; and

a drain discharge means connected to said drain chamber, said drain discharge means discharging said drain from said drain chamber.

4,908,051

AXIAL SWIRL DEVICE FOR A CONTACT AND SEPARATION MEMBER

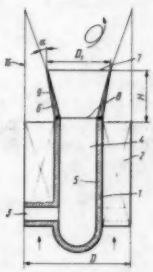
Viktor M. Kiselev, Kharkov, U.S.S.R., assignor to Ukrainsky Nauchno-Issledovatelsky Institut Prirodnykh Gazov "Ukrniigaz", Kharkov, U.S.S.R.

PCT No. PCT/SU86/00090, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988, PCT Pub. No. WO88/02273, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 23, 1986, Ser. No. 228,697

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—457 6 Claims



2. An axial swirl device for a contact and separation member for mass-exchange and separation apparatuses comprising:

a hollow sleeve, one end of said sleeve being closed and disposed on an inlet side of fluid being swirled, the other end of said sleeve being open and disposed opposite to the closed end on an outlet side of fluid being swirled;

vanes located on the outer surface of said sleeve, extending at an angle with respect to the longitudinal axis thereof in proximity to said open end of said sleeve, a swirl chamber defined by a continuation of the circumscribed outer surface of said vanes;

a deflector means mounted inside said swirl chamber in coaxial relation to said sleeve at the open end thereof and made in the form of a body of revolution which is a continuation of the outer surface of said sleeve and which is so shaped that a tangent line to a generant of an outer surface of said body of revolution at the point most remote from said vanes is tilted toward the inner wall of the swirl chamber at an angle of up to 15° with respect to the longitudinal axis of said sleeve, the deflector means comprising a diffuser having a narrow end secured to the sleeve, the vanes having a circumscribed circle and a flared end having an outside diameter equal to 0.5 to 0.7 times the diameter of the circumscribed circle of the vanes.

4,908,052

FIBERS AND FILTERS CONTAINING SAID FIBERS

Theodore Largman, Morristown; Frank Mares, Whippany, both of N.J., and Clarke A. Rodman, East Providence, R.I., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 40,446, Apr. 20, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,194

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—486 34 Claims

1. A filter element for removal of entrained solid particles from a fluid stream, each element comprising:

a body comprised of a network of fibers positioned to entrap all or a portion of said particles in said stream passing through said body, said fibers comprising a major amount of a continuous phase comprising one or more melt processible polyesters of fiber forming molecular weight and a minor amount of one or more melt processible polyolefins of fiber forming molecular weight dispersed in said continuous phase such that the concentration of said polyolefins at or near the surface of said fiber is greater than the concentration of said polyesters at or near the surface of said fibers.

4,908,053

PROCESS FOR PRODUCING CHALCOGENIDE GLASS FIBER

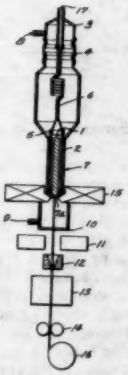
Junji Nishii; Ikuo Inagawa, both of Kanagawa; Takashi Yamagishi, Hyogo; Shozo Morimoto, and Ryuji Iizuka, both of Kanagawa, all of Japan, assignors to Non Oxide Glass Research and Development Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 232,998

Claims priority, application Japan, Aug. 19, 1987, 62-204172; Feb. 23, 1988, 63-38474; Mar. 7, 1988, 63-51539; Mar. 9, 1988, 63-53748

Int. Cl.[4] C03B *37/027*

U.S. Cl. 65—3.11 14 Claims



1. A process for producing a chalcogenide glass fiber which comprises placing a cylindrical chalcogenide glass preform vertically in a cylindrical crucible furnished with a nozzle in its bottom portion, heating the crucible only at vicinity of the nozzle, and continuously drawing the glass into a fiber with the temperature of the crucible at the vicinity of the nozzle being maintained at such a level that the viscosity of the glass is within the range of 10^3 to $10^{7.5}$ poises.

4,908,054

METHOD FOR MAKING INFRARED POLARIZING GLASSES

Kelly E. Jones, Salt Lake City, Utah, and Frederick E. Noll, Horseheads, N.Y., assignors to Corning Incorporated, Corning, N.Y.

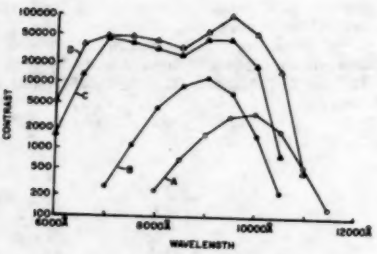
Filed Feb. 21, 1989, Ser. No. 312,678

Int. Cl.[4] C03C *3/26, 23/00*

U.S. Cl. 65—30.11 10 Claims

1. A method for making a glass article exhibiting a relatively broad band of high contrast polarizing properties in the infrared region of the radiation spectrum from glasses which will be phase separable or will exhibit photochromic properties through the presence of silver halide particles therein selected from the group consisting of AgCl, AgBr, and AgI, which method comprises the steps of:

(a) melting a batch for a glass containing silver and at least one halide selected from the group consisting of chloride, bromide, and iodide;
(b) cooling and shaping said melt into a glass article of a desired configuration;
(c) subjecting said glass article to a temperature at least above the strain point, but not in excess of 75° C. above the softening point of the glass, for a sufficient length of time to cause the generation of silver halide particles therein selected from the group consisting of AgCl, AgBr, and AgI, said particles ranging in size between about 200–5000 Å;
(d) elongating said glass article under stress at a temperature above the annealing point, but below that where said glass exhibits a viscosity of about 10^8 poises, such that said silver halide particles are elongated to an aspect ratio of at



least 5:1 and aligned in the direction of the stress; and, thereafter,
(e) exposing said elongated glass article to a reducing environment at a pressure at least one atmosphere greater than atmospheric pressure and at a temperature above about 250° C., but no higher than about 25° C. above the annealing point of the glass, for a period of time sufficient to develop a reducing surface layer on said glass article having a thickness of at least 10 microns wherein at least a portion of said elongated silver halide particles are reduced to elemental silver particles having aspect ratios greater than 2:1 which are deposited in and/or upon said elongated particles, whereby said glass article exhibiting a relatively broad range of high contrast polarizing properties in the infrared region of the radiation spectrum is formed.

4,908,055

METHOD OF MANUFACTURING THEREOF FLUORESCENT LAMP

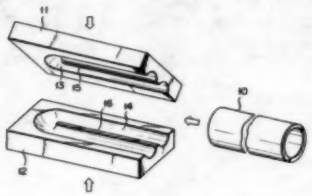
Akitoshi Komiya, and Taketo Kamei, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 104,557, Sep. 29, 1987, abandoned, which is a continuation of Ser. No. 858,853, Apr. 30, 1986, abandoned, which is a continuation of Ser. No. 666,927, Oct. 31, 1984, abandoned. This application Jan. 18, 1989, Ser. No. 298,093

Int. Cl.[4] H01J *9/26;* **C03B** *33/06*

U.S. Cl. 65—77 **6 Claims**

1. A manufacturing method of a bulb for a fluorescent lamp comprising the steps of:
heating and softening a straight glass tube having two ends where at least one of said two ends is open, and
molding said straight glass tube into a bulb of predetermined shape, having a discharging path with two ends, said molding step including the following steps:
(i) placing said straight glass tube into a press mold having first and second press mold sides, each of said press mold sides having molding surfaces corresponding to a predetermined shape of said bulb, including opening portions for mounting electrodes,
(ii) pressing the first and second press mold sides together so as to collapse in a diametrical direction said tube from opposite sides of the tube, and
(iii) injecting a pressurized gas into said mold to form said bulb by introducing said gas at said open end of said glass tube,



wherein the pressing step and the injecting step cause the entire outer wall of said tube to be surrounded and deformed by said press mold and cause a bridging portion connecting adjacent sides of said discharge path to be formed.

4,908,056

HETEROCYCLIC ACYL SULFONAMIDES

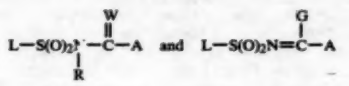
Chi-Ping Tseng, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 101,314, Sep. 25, 1987, Pat. No. 4,838,925, which is a continuation-in-part of Ser. No. 22,279, Mar. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 892,062, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 856,511, Apr. 25, 1986, abandoned. This application Feb. 17, 1989, Ser. No. 311,897

Int. Cl.[4] A01N *43/54, 43/90, 43/42;* **C07D** *401/12, 401/14, 403/12, 403/14, 409/12*

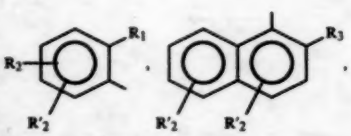
U.S. Cl. 71—90 **34 Claims**

1. A compound selected from



Ia Ib

wherein
R is H: C_1–C_3 alkyl optionally substituted with halogen; C_1C_3 thioalkyl optionally substituted with halogen; benzyl optionally substituted with F, Cl, OCH_3, SCH_3 or NO_2; allyl; propargyl; —C(O)(C_1–C_3 alkyl); CO_2CH_3; or $CO_2CH_2CH_3$;
G is Cl, OR′ or SR′;
R′ is C_1–C_3 alkyl optionally substituted with halogen;
L is



L-1 L-2

W is O, S, NR″ or NOR″;
R″ is H or C_1–C_4 alkyl optionally substituted with halogen;

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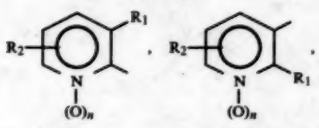
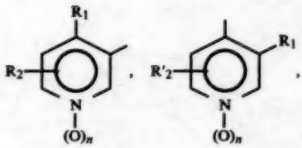
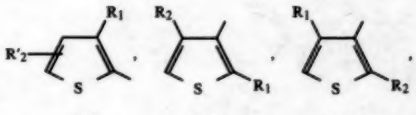


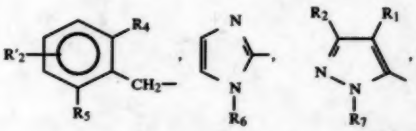
L-3 L-4



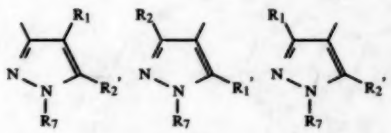
L-5 L-6



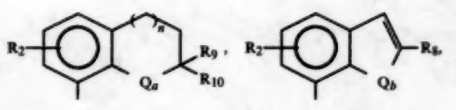
L-7 L-8 L-9



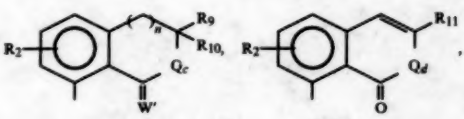
L-10 L-11 L-12



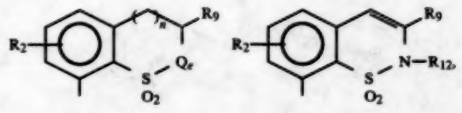
L-13 L-14 L-15



L-16 L-17



L-18 L-19



L-20 L-21

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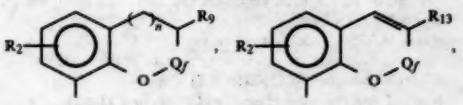
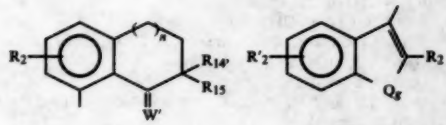


L-22 L-23



L-24 L-25

R_1 is H; halogen; NO_2; CN; C_1–C_4 alkyl optionally substituted with F, Cl, Br, CN, OCH_3 or SCH_3; C_2–C_4 alkenyl optionally substituted with F, Cl, Br, OCH_3 or SMe; C_3–C_4 alkynyl; C_3–C_5 cycloalkyl optionally substituted with F, Cl or CH_3; $C(O)R_{16}$; $C(OCH_2CH_2O)R_{16}$; $C(R_{16})(OR_{17})(OR_{18})$; CO_2R_{19}; $C(O)NR_{20}R_{21}$; N_3; $S(O)_2NR_{22}R_{23}$; $S(O)_2OR_{24}$; $OS(O)_2R_{25}$; phenyl optionally substituted by F, Cl, Br, CH_3 or OCH_3; ER_{26}; $(CH_2)_nQ$ or $(CH_2)_nQ_1$;

R_2 is H, halogen, CN, NO_2, C_1–C_3 alkyl optionally substituted with halogen, CO_2R_{19}, $S(O)_2NR_{27}R_{28}$, $NR_{29}R_{30}$, ER_{31}; or C_1–C_2 alkyl substituted with C_1–C_2 alkoxy, C_1–C_2 haloalkoxy, C_1–C_2 alkylthio, C_1–C_2 haloalkylthio, CN, OH or SH;

R_2' is independently H, F, Cl, Br, CH_3, OCH_3, or SCH_3;

R_3 is H, CH_3, OCH_3, OCF_2H, F, Cl, Br, CO_2R_{19}, $S(O)_2N(CH_3)_2$, $OS(O)_2CH_3$ or $S(O)_nCH_3$;

R_4 is Cl, NO_2, CO_2CH_3, $CO_2CH_2CH_3$, $C(O)N(CH_3)_2$, $OS(O)_2CH_3$, $S(O)_2CH_3$, $S(O)_2CH_2CH_3$, OCH_3 or OCH_2CH_3;

R_5 is H, C_1–C_3 alkyl, F, Cl, Br, No_2, $S(O)_2NR_{32}R_{33}$, $S(O)_2N(OCH_3)CH_3$ or $S(O)_pR_{34}$;

R_6 is C_1–C_3 alkyl or phenyl;

R_7 is H. C_1–C_3 alkyl optionally substituted with halogen, C_3–C_4alkenyl, or phenyl;

R_8 is H or CH_3;

R_9 is H, CH_3 or CH_2CH_3;

R_{10} is H, CH_3 or CH_2CH_3;

R_{11} is H, Cl or C_1–C_3 alkyl;

R_{12} is H, C_1–C_4 alkyl optionally substituted with F, Cl, Br or OCH_3; C_3–C_5 cycloalkyl optionally substituted with F, Cl or OCH_3; C_3–C_4 alkenyl; or C_3–C_4 alkynyl;

R_{13} is H or C_1–C_3 alkyl;

R_{14} is H, F, Cl, Br, CH_3 or CH_2CH_3;

R_{15} is H, F, Cl, Br. CH_3 or CH_2CH_3;

R_{16} is C_1–C_4 alkyl optionally substituted with F, Cl, Br or OCH_3; C_3–C_5 cycloalkyl optionally substituted with F or Cl; or C_3–C_4 alkenyl;

R_{17} and R_{18} are independently C_1–C_3 alkyl;

R_{19} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl; C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

R_{20} is H, CH_3 or CH_2CH_3;

R_{21} is CH_3, CH_2CH_3, $CH_2CH_2CH_3$, OCH_3 or OCH_2CH_3; or R_{20} R_{21} may be taken together to form $—(CH_2)_2(CH_2)_m(CH_2)_2—$ and $—CH_2CH_2OCH_2CH_2—$;

R_{22} is C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, OCH_3, OCH_2CH_3, $N(CH_3)_2$, C_3–C_4 alkenyl, C_3–C_4 alkynyl, cyclopropylmethyl or C_3–C_4 cycloalkyl;

R_{23} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

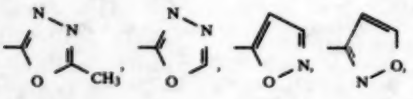
R_{22} and R_{23} may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$ or $—CH_2CH_2OCH_2CH_2—$;

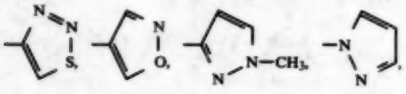
R_{24} is C_1–C_3 alkyl or C_1 –C_3 haloalkyl;

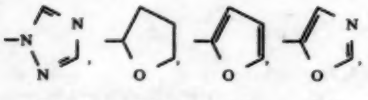
R_{25} is C_1–C_3 alkyl or $N(CH_{32}$;

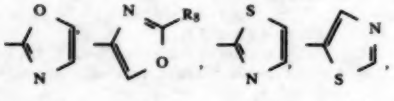
R_{26} is C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkoxyalkyl,

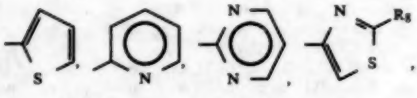
C_3–C_4 alkenyl, C_3–C_4 alkynyl, phenyl optionally substituted by F, Cl, Br, CH_3 or OCH_3, or C_2–C_4 haloalkenyl;
R_{27} is C_1–C_3 alkyl;
R_{28} is H, C_1–C_4 alkyl or methoxy;
R_{27} and R_{28} may be taken together to form $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$;
R_{29} and R_{30} are independently H, CH_3 or CH_2CH_3;
R_{31} is C_1–C_4 alkyl optionally substituted with F, Cl or OCH_3;
R_{32} is CH_3 or CH_2CH_3;
R_{33} is H, CH_3 or CH_2CH_3;
R_{34} is C_1–C_3 alkyl, C_3–C_4 alkenyl or C_3–C_4 alkynyl;
Q_a is O, S, S(O), $S(O)_2$ or NCH_3;
Q_b is O, S or $S(O)_2$;
Q_c is O, S, NH, $N(C_1$–C_3 alkyl), $NCH_2CH{=}CH_2$ or $NCH_2C{\equiv}CH$;
Q_d is O, NH, $N(C_1$–C_3 alkyl), $NCH_2CH{=}CH_2$ or $NCH_2C{\equiv}CH$;
Q_e is O or NR_{12};
Q_F is C(O) or $S(O)_2$;
Q_g is O, S, NH or $N(C_1$–C_3 alkyl);
n is 0 or 1;
p is 0, 1 or 2;
W' is O or S;
E is O, S, S(O) or $S(O)_2$;
Q is

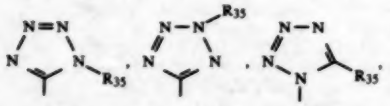

Q-1 Q-2 Q-3 Q-4


Q-5 Q-6 Q-7 Q-8


Q-9 Q-10 Q-11 Q-12


Q-13 Q-14 Q-15 Q-16


Q-17 Q-18 Q-19 Q-20


Q-21 Q-22 Q-23

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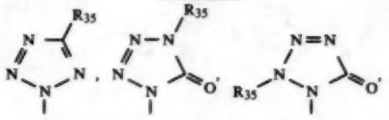
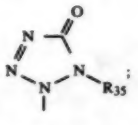
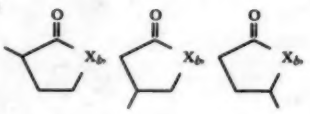
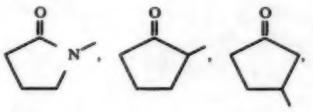
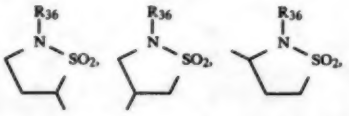

Q-24 Q-25 Q-26

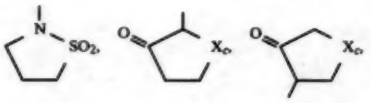

Q-27

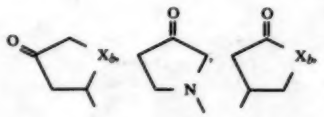
Q_1 is

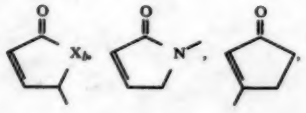

Q_1-1 Q_1-2 Q_1-3


Q_1-4 Q_1-5 Q_1-6


Q_1-7 Q_1-8 Q_1-9


Q_1-10 Q_1-11 Q_1-12


Q_1-13 Q_1-14 Q_1-15


Q_1-16 Q_1-17 Q_1-18

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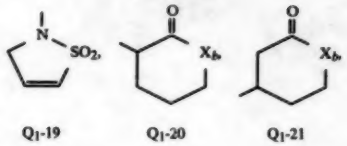
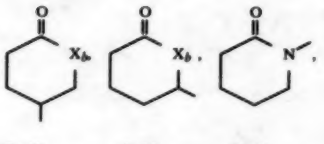
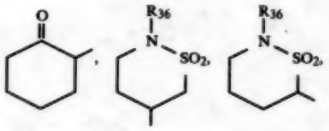


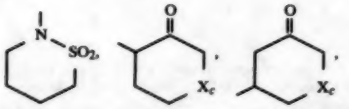
Q_1-19 Q_1-20 Q_1-21



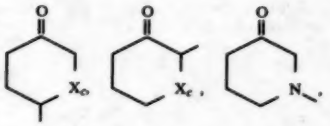
Q_1-22 Q_1-23 Q_1-24



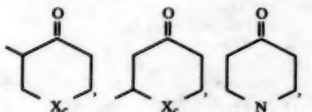
Q_1-25 Q_1-26 Q_1-27



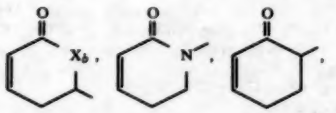
Q_1-28 Q_1-29 Q_1-30



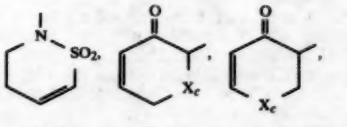
Q_1-31 Q_1-32 Q_1-33



Q_1-34 Q_1-35 Q_1-36



Q_1-37 Q_1-38 Q_1-39



Q_1-40 Q_1-41 Q_1-42

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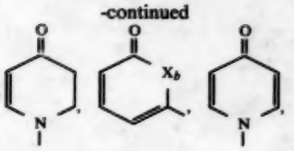
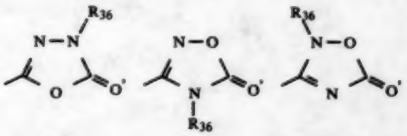
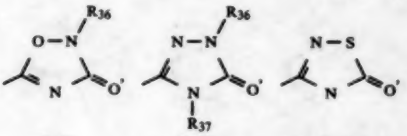


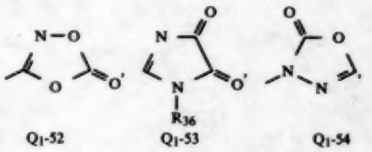
Q_1-43 Q_1-44 Q_1-45



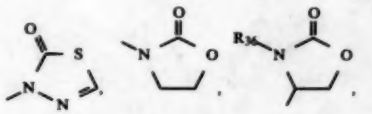
Q_1-46 Q_1-47 Q_1-48



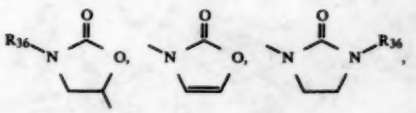
Q_1-49 Q_1-50 Q_1-51



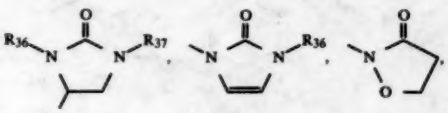
Q_1-52 Q_1-53 Q_1-54



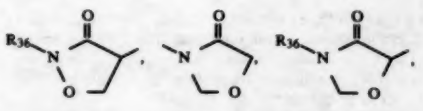
Q_1-55 Q_1-56 Q_1-57



Q_1-58 Q_1-59 Q_1-60



Q_1-61 Q_1-62 Q_1-63



Q_1-64 Q_1-65 Q_1-66

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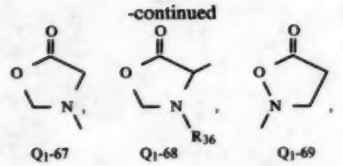
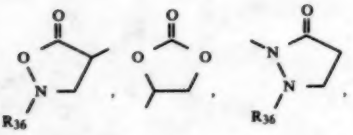
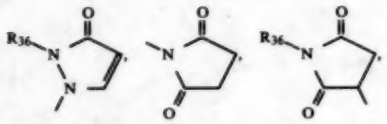
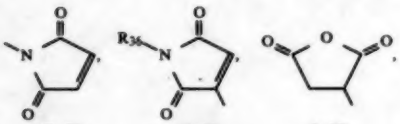
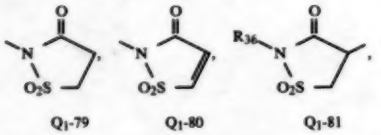
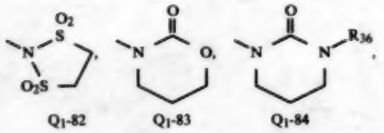

Q1-67 Q1-68 Q1-69

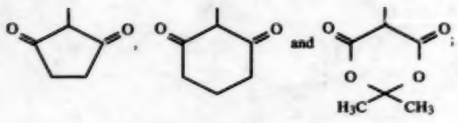

Q1-70 Q1-71 Q1-72


Q1-73 Q1-74 Q1-75


Q1-76 Q1-77 Q1-78


Q1-79 Q1-80 Q1-81


Q1-82 Q1-83 Q1-84


Q1-85 Q1-86 Q1-87

wherein

Q_1-1 through Q_1-87 may be optionally substituted with 1 or 2 groups selected from C_1–C_2 alkyl or C_1–C_2 haloalkyl;

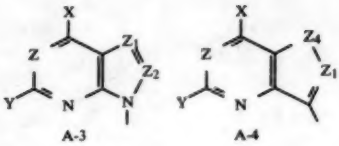
R_{35} is H, C_1–C_3 alkyl or allyl;

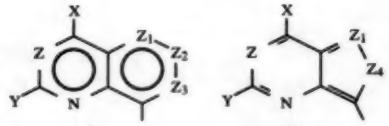
R_{36} and R_{37} are independently H or C_1–C_3 alkyl;

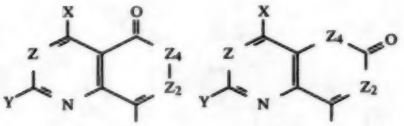
X_b is O or NR_{36}; and

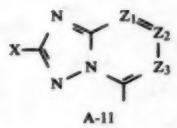
X_c is O, S, S(O), S(O)$_2$ or NR_{36};

A is

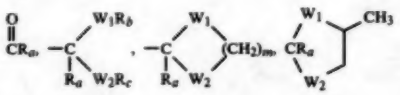

A-3 A-4


A-5 A-6


A-8 A-9


A-11

X or Y is H, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylsulfinylalkyl, C_1–C_4 haloalkyl, C_2–C_5 alkylsulfonylalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, C_2–C_5 alkylthioalkyl,



or $N(OCH_3)CH_3$;

W_1 and W_2 are independently O or S;

m and m' are independently 2 or 3;

R_a is H or CH_3;

R_b and R_c are independently C_1–C_2 alkyl;

Z is CH, N, CCH_3, CCH_2CH_3, CCl or CBr;

Z_1 is C-U, N or N-O;

Z_2 and Z_3 are independently N or C-U;

Z_4 is NCH_3, O, S or CH_2;

U is H, F, Cl, Br, C_1–C_2 alkyl optionally substituted by F, Cl, Br or OCH_3, CN, NO_2, NMe_2, OR'''', SR'''' or CO_2CH_3;

R'''' is C_1–C_2 alkyl optionally substituted with F, Cl, Br or OCH_3;

X_a is CH_3, CH_2CH_3 or CH_2CF_3; and

X_d is H or CH_3;

and their agriculturally suitable salts; provided that

(1) the total number of carbon atoms of R_{22} and R_{23} is less than or equal to five;

(2) when X or Y is Cl, F, Br or I, then Z is CH and the remaining X or Y is OCH_3, OCH_2CH_3, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;

(3) when X or Y is C_1 haloalkoxy, then Z is CH;

(4) at least one of X or Y is X' where X' is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino; and

(5) the total number of carbon atoms of R_{27} and R_{28} is less than or equal to five,

(6) when A is A-3, A-4, A-5, A-6, A-8 or A-9 then Z is a carbon value, and

(7) when A is A-11 all of Z_1, Z_2, or Z_3, are carbon values

19. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid diluent, liquid diluent and mixtures of the foregoing.

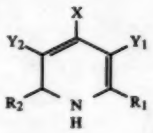
4,908,057

SUBSTITUTED 2,6-SUBSTITUTED 1,2- OR 1,6-DIHYDRO PYRIDINE COMPOUNDS

John P. Chupp, Kirkwood; Len F. Lee, St. Charles; William F. Goure, Maryland Heights, and John M. Molyneaux, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 1, 1988, Ser. No. 227,030
Int. Cl.[4] C07D *401/06;* A01N *43/40*
U.S. Cl. 71—92 **21 Claims**

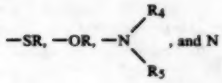
1. A compound represented by the formula



wherein:

one of Y_1 and Y_2 is

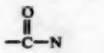
in which Z_1 is selected from



where R, R_4 and R_5 are the same or different and are selected from lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl, lower haloalkenyl, and lower cyanoalkyl, and

is selected from azetidinyl and a saturated or unsaturated 5-membered heterocyclic ring moiety containing 1–2 nitrogen atoms, the remaining atoms being carbon atoms, optionally substituted with 1 to 3 groups which are the same or different and are selected from lower alkyl, lower alkoxy, cyano, halo, nitro, lower haloalkyl, lower alkoxy-lower alkyl and lower dialkoxy-lower alkyl; Z_2 is selected from O and S;

the other of Y_1 and Y_2 is



where —N is as defined above;

R_1 and R_2 are independently selected from fluorinated methyl, chlorofluorinated methyl, chlorinated methyl, and lower alkyl radicals, provided that one of R_1 and R_2 must be a fluorinated methyl or chlorofluorinated methyl radical;

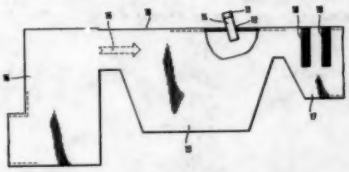
X is selected from lower alkyl, lower (cycloalkyl)-lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl and cyclobutyl.

4,908,058

METHOD AND APPARATUS FOR REDUCING DUST ACCRETIONS WHILE TREATING GASES IN A SMELTING FURNACE

Risto U. Saarinen, Espoo, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Apr. 6, 1987, Ser. No. 34,707
Claims priority, application Finland, May 9, 1986, 861937
Int. Cl.[4] C21B *3/04*
U.S. Cl. 75—25 **11 Claims**



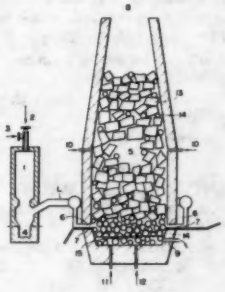
1. A method for regulating the sulphatizing of exhaust gases and thus reducing dust accretions in the treatment of sulphur dioxide-containing exhaust gases in a smelting furnace by changing the composition of the exhaust gases, comprising blowing oxygen-bearing gas into the exhaust gases at an angle with respect to a flow of exhaust gases through a radiation chamber of a waste heat boiler for lowering the temperature of gases contained in the radiation chamber to cause sulphatizing to take place in the radiation chamber.

4,908,059

PROCESS FOR MELTING COLD IRON MATERIAL

Akihide Hikosaka, Mishima; Tsuyoshi Mimura, Kobe; Tomio Suzuki, Kobe; Takeo Yoshigae, Kobe, and Shuzo Ito, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 27, 1989, Ser. No. 302,355
Claims priority, application Japan, Jan. 29, 1988, 63-20167
Int. Cl.[4] C21B *11/00*
U.S. Cl. 75—43 **7 Claims**



1. In a melting process for the production of molten iron

wherein iron material, is charged into a melting furnace, the improvement in said process which comprises feeding a carbon-containing solid material along with a oxygen-containing gas, having an oxygen content corresponding to the air ratio of 0.4 to 0.9, into a precombustion vessel and effecting therein a primary combustion yielding a hot reducing gas containing combustion residues; separating said residues from said hot reducing gas and, then introducing the thus obtained hot reducing gas along with an oxygen-containing gas having an oxygen content corresponding to the air ratio of 0.7 to 1.3, in total with the oxygen-containing gas supplied to the precombustion vessel, into a melting furnace and effecting therein a secondary combustion.

4,908,060

METHOD FOR TREATING MOLTEN METAL WITH A ROTARY DEVICE

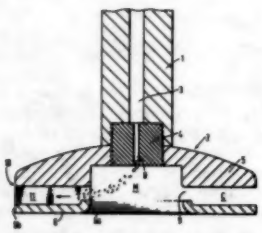
Dietger Duenkelmann, Bocholt, Fed. Rep. of Germany, assignor to Foseco International Limited, Birmingham, United Kingdom

Division of Ser. No. 306,054, Feb. 6, 1989, Pat. No. 4,867,422. This application Jun. 13, 1989, Ser. No. 366,875

Claims priority, application United Kingdom, Feb. 24, 1988, 8804267

Int. Cl.[4] C21C 7/00

U.S. Cl. 75—61 **5 Claims**



1. A method of treating molten metal using a rotary device comprising a hollow shaft with a gas discharge end and a hollow rotor attached to the shaft, the rotor having a plurality of vanes extending from the shaft towards the periphery of the rotor and dividing the rotor into a plurality of compartments, each compartment having an inlet adjacent the shaft and an outlet adjacent the periphery of the rotor, and the rotor having means for passing gas from the discharge end of the shaft into the compartments, wherein the discharge end of the shaft opens into a manifold in the rotor, open at one end thereof, and the inlets for the compartments are present in the wall of the manifold of the rotor, the method comprising the steps of: dispersing a gas in molten metal contained in a vessel by: (a) rotating the rotary device so that the molten metal enters the manifold through the open end thereof, and (b) by supplying gas to the shaft so that the gas passes from the hollow interior of the shaft to the manifold, whereby a dispersion of gas in molten metal flows into the compartments through the inlets and out through the outlets.

4,908,061

ANTIFOULING COATING

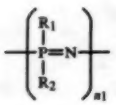
Kiyoshi Nanishi, and Hiroyuki Nakayama, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Division of Ser. No. 929,834, Nov. 13, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 245,391

Int. Cl.[4] C09D 5/16

U.S. Cl. 106—18.31 **19 Claims**

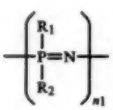
1. An antifouling underwater substrate comprising an underwater substrate having coated thereon a coating containing, as the major component, (i) a phosphorus nitride compound represented by the general formula (I):



(I)

wherein R_1 and R_2 are $-OR_3$,

or $-NH-(CH_2)n_2-COOR_3$ and are the same or different, R_3 is $C_mH_{2m}+1$ or an aromatic group, $_1$ is an integer of 3 or more, n_2 is an integer of 1 to 5, and m is an integer of 1 to 20, and/or (ii) a halogenated phosphorus nitride compound represented by the general formula (II):



(II)

wherein n_1 is an integer of 3 or more, at least a part of R_1 and of R_2 is a halogen atom and the remaining parts of R_1 and of R_2 are $-OR_3$,

or $-NH-(CH_2)n_2-COOR_3$ and are the same or different respectively, R_3 is $C_mH_{2m}+1$, n_2 is an integer of 1 to 5, and m is an integer of 1 to 20, and (iii) a coating resin selected from a water-soluble resin and a water-insoluble resin, with the phosphorus nitride compound (i) and/or the halogenated phosphorus nitride compound (ii) being leached into the water to thereby prevent fouling.

4,908,062

WATER-SOLUBLE DYE

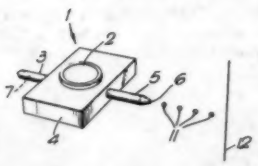
Brian Balmforth, Huddersfield, and Nigel Hughes, Oldham, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Jan. 9, 1989, Ser. No. 294,655

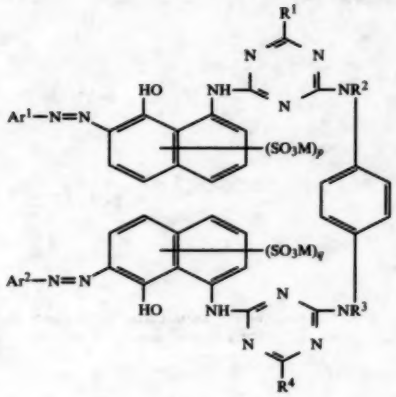
Claims priority, application United Kingdom, Jan. 22, 1988, 8801486

Int. Cl.[4] C09D 11/02

U.S. Cl. 106—22 **19 Claims**



1. A water-soluble dye, free from cellulose reactive groups, of the formula:



wherein
each of Ar^1 and Ar^2, independently, represents an optionally substituted phenyl or naphthyl radical,
each of R^1 and R^4, independently, represents —OR^5 or —NR^6R^7,
R^5 represents hydrogen or alkyl,
R^6 represents hydrogen, alkyl, aryl or a radical of the formula $-(C_aH_{2a}O)_m(C_bH_{2b}O)_nH$,
R^7 represents hydrogen, alkyl, aryl, a radical of the formula $-(C_aH_{2a}O)_m(C_bH_{2b}O)_nH$ or a radical of a mono- or disazo dye, or
R^6 and R^7 together form a morpholine ring,
a and b are different integers from 1 to 8,
m is an integer from 1 to 10,
n is an integer from 0 to 9,
each of R^2 and R^3, independently, represents hydrogen or alkyl,
M represents hydrogen, ammonium or a monovalent metal, and each of p and q, independently is an integer from 1 to 3.

4,908,063

ADDITIVE COMPOSITION FOR WATER-BASED INKS

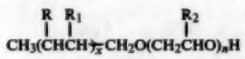
Timothy J. Baker, Claremore; John H. Woods, Tulsa, both of Okla., and Jeffrey R. Zerr, Irving, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 4, 1988, Ser. No. 267,064
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—31 **22 Claims**

1. A water-based ink containing a pigment and an effective amount of a formulation aid comprising in an aqueous dispersion:

(a) water;

(b) a dispersant represented by the formula:



wherein R and R_1 are independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl; R_2 is selected from the group consisting of hydrogen and methyl and x is about 8 to about 75 and n is about 2 to about 65; and

(c) a finely divided mostly linear aliphatic hydrocarbon and/or modified hydrocarbon having a molecular weight of about 300–3,000 and an average particle size of less than about 20 microns.

4,908,064

ROAD ASPHALT COMPOSITION

Mark A. Plummer, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 27, 1988, Ser. No. 224,979
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—281.1 **20 Claims**

1. An asphalt composition for use as a road asphalt, comprising in combination with asphalt, particles of petroleum catalytic cracking catalyst present substantially uniformly throughout the asphalt in amounts, by weight of the asphalt, in the range of 0.1% to 5.0%.

4,908,065

COATING SOLUTION FOR USE IN THE FORMATION OF METAL OXIDE FILM

Katsuya Tanitsu, Kawasaki; Muneo Nakayama, Tokyo, and Yoshimi Sato, Mishima, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan

Filed Jan. 5, 1988, Ser. No. 141,075
Claims priority, application Japan, Jan. 7, 1987, 62-556
Int. Cl.[4] C09K *3/00*
U.S. Cl. 106—287.24 **5 Claims**

1. A coating solution for use in the formation of a metal oxide film, comprising:

(a) a β-diketone;

(b) at least one element or compound selected from the group consisting of elements capable of forming complexes with said β-diketone, salts of the elements and hydrolysates of alkoxides of the elements; and

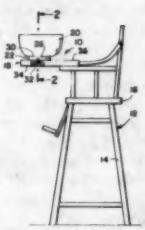
(c) an aprotic polar solvent.

4,908,066

NO SPILL HIGH CHAIR TRAY/BOWL

Therese A. Taylor, 4601 N. 102nd Ave., No. 1049, Phoenix, Ariz. 85039, and George Spector, New York, N.Y., assignors to Therese A. Taylor, Phoenix, Ariz., a part interest

Filed Feb. 15, 1989, Ser. No. 311,033
Int. Cl.[4] A47B *85/00*
U.S. Cl. 108—26 **2 Claims**



1. An improved feeding tray for a high chair of the type having a supporting frame and a seating structure supported by the frame said tray comprising:

(a) a tray structure mounted on the frame in convenient relation to the seating structure for use by a child thereof;

(b) a bowl adapted to receive food therein; and

(c) means for detachably holding said bowl to said tray structure to prevent the bowl from spilling and slipping off said tray structure during meal time for the child, wherein said detachably holding means includes:

(d) said bowl having a bottom-recessed with an externally threaded connector within said recess; and

(e) a base secured to said tray having an internally threaded connector wherein said base is snugly received fully within said recess when said connector is fully threaded into said aperture.

4,908,067

HYDROLYSIS PROCESS

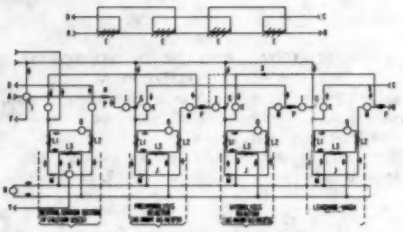
Jack T. H. Just, 13 Holland Street, Rotorua, New Zealand, assignor to Jack T. H. Just, Rotorua, New Zealand

Continuation-in-part of Ser. No. 54,031, May 21, 1987, abandoned, which is a continuation of Ser. No. 774,561, Sep. 10, 1985, abandoned. This application Jan. 21, 1988, Ser. No. 147,118

Claims priority, application New Zealand, Sep. 13, 1984, 209527

Int. Cl.[4] C13K *1/02*

U.S. Cl. 127—37 4 Claims



1. A process for the continuous hydrolysis of wood, comprising:

(I) continuously feeding said wood as a feedstock to a receiving of a presoak container;

(II) injecting a weak acid solution into the receiving means to presoak the feedstock;

(III) continuously feeding the acid presoak feedstock under pressure from the receiving means to a first reactor loop of a tubular reactor;

(IV) injecting water into the tubular reactor countercurrently to said feedstock to form a slurry;

(V) continuuously subjecting the slurry under pressure as it goes through several reactor loops in series;

(VI) heating each reactor loop with a first indirect heat exchanger to raise the temperature of the pressurized slurry therein to a temperature sufficient for hydrolysis of the slurry to occur;

(VII) cooling the pressurized slurry in each reactor loop with a second indirect heat exchanger to avoid the generation of vapour to ensure that the liquid portion of the slurry remains as a liquid;

(VIII) recovering heat from said second indirect heat exchanger and utilizing the heat recovered to supply at least part of the heat requirements of said first heat exchanger;

(IX) reducing with pressure reduction apparatus at an outlet of each reactor loop the pressure of the cooled slurry therein while maintaining the pressure in the reactor loop while the slurry is continuously discharged;

(X) separating the solid portion of the slurry using a separator;

(XI) recovering the solid portion containing lignin and passing it to the next reactor loop of the tubular reactor; and

(XII) recovering the liquid portion of the slurry which is sugar rich acid-hydrolysate and injecting a part of the liquid portion to the preceding reactor loop of the tubular reactor.

4,908,068

REMOVAL OF FIBROUS MATERIAL

John Pittman, Huddersfield, and Enid Pittman, Cleckheaton, both of Great Britain, assignors to Ruth Coneglio and Ben Coneglio, both of Hannon, Canada

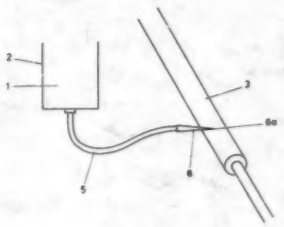
Filed Oct. 26, 1987, Ser. No. 113,246

Claims priority, application United Kingdom, Oct. 25, 1986, 8625602

Int. Cl.[4] D04H *1/64;* B08B *15/00*

U.S. Cl. 134—4 6 Claims

1. A method of treating fibrous material to prevent the release of particles of the material when the material is removed by cutting, tearing or otherwise, the method comprising injecting into the fibrous material a liquid containing a



gelatine, and then allowing the injected liquid to set thereby forming a gel of which the fibrous material is an integral part.

4,908,069

ALLOYS CONTAINING GAMMA PRIME PHASE AND PROCESS FOR FORMING SAME

Roger D. Doherty, Wynnewood, and Rishi P. Singh, Philadelphia, both of Pa., assignors to SPS Technologies, Inc., Newton, Pa.

Filed Oct. 19, 1987, Ser. No. 110,132

Int. Cl.[4] C22F *1/10*

U.S. Cl. 148—2 20 Claims

1. A method of making a work-strengthenable alloy which includes a gamma prime phase, which method comprises forming a melt consisting essentially of the following elements in percent by weight:

molybdenum	6–16
chromium	13–25
iron	0–23
nickel	10–55
carbon	0–0.05
boron	0–0.05
cobalt	balance at least 20,

and one or more elements which form gamma prime phase with nickel, the electron vacancy number, N_v, of the alloy being defined by

$$N_v = 0.61\ Ni + 1.71\ Co + 2.66\ Fe + 4.66\ Cr + 5.66\ Mo$$

wherein the respective chemical symbols represent the effective atomic fractions of the respective elements present in the alloy, said value not exceeding the value

$$N_v = 2.82 - 0.017\ W_{Fe}$$

where W_{Fe} is the percent by weight of iron in the alloy for those alloys containing no iron or less than 13 percent by weight iron and W_{Fe} is 13 for alloys containing from 13–23 percent by weight iron; cooling said melt; and heating the alloy at a temperature of from 600°–900° C. for a time sufficient to form said gamma prime phase, prior to strengthening said alloy by working it to achieve a reduction in cross-section of at least 5 percent.

4,908,070

PROCESS AND DEVICE FOR THE LONGITUDINAL CUTTING OF CONTINUOUS CASTINGS

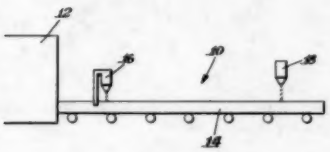
Paul Grohmann, Maria Enzersdorf, Austria, assignor to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 237,134

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730150

Int. Cl.[4] B23K 7/00

U.S. Cl. 148—9 R 9 Claims



1. In a process for the longitudinal cutting of a continuous casting as it emerges from a continuous casting installation, including the steps of heating the casting to the ignition temperature, and longitudinally cutting the casting by means of a high pressure jet of liquid oxygen, the improvement being in mounting a stationary cutting tip downstream from the continuous casting installation to direct the high pressure jet of liquid oxygen toward the path of travel of the continuous casting, mounting a preheater to the continuous casting after it emerges from the continuous casting installation, synchronously moving the preheater with the continuous casting toward the cutting tip, heating the continuous casting by the preheater during the suynchronous movement of the preheater and the continuous casting, stopping movement of the preheater immediately before the cutting tip is reached, and moving the continuous casting past the cutting tip to longitudinally cut the continuous casting by means of the liquid oxygen stream emerging from the cutting tip.

4,908,071

METHOD OF MANUFACTURING TUBES OF ZIRCONIUM ALLOYS WITH IMPROVED CORROSION RESISTANCE FOR THERMAL NUCLEAR REACTORS

Erik T. Anderrson; Sten A. Wilson, both of Sandviken, Sweden, and John H. Schemel, Kennewick, Wash., assignors to Santrade Limited, Lucerne, Switzerland

Continuation of Ser. No. 838,690, Mar. 12, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 226,517

Claims priority, application Sweden, Mar. 12, 1985, 8501216; Mar. 12, 1985, 8501217

Int. Cl.[4] C22F 1/18

U.S. Cl. 148—11.5 F 4 Claims

1. A method of making cladding tubes of a zirconium alloy containing 1–5 percent by weight of alloying elements including Sn, Fe, Cr and Ni and the rest essentially Zr, for the purpose of improving the corrosion resistance to general corrosion in media typical of water cooled thermal nuclear reactors at high pressure and high temperature, comprising annealing the material after extrusion and between cold rollings in the α-phase range at a temperature within the interval 625°–790° C., at a combination of temperature and time which essentially gives complete equilibrium between zirconium matrix and precipitated secondary phase particles at which the temperature/time is defined by an annealing parameter

$$A = t \cdot e^{-\frac{6500}{RT}},$$

where t is the annealing time is hours, T is the absolute temperature, R is the general gas constant in cal mold · degree, which at equilibrium shall exceed a critical value $A_c = 2.3 \cdot 10^{-14}$, where said critical value means the following examples of shortest annealing times within the temperature interval 625°–790° C.,

Annealing temperature (°C.)	Annealing time (h)
790	0.5
725	3.9
675	22.2
650	56.5
625	151.3

cooling the tubes at a maximum rate of 3° C./minute and thereby obtaining a maximum volume fraction of the secondary phase particles.

4,908,072

IN-PROCESS FORMATION OF HARD SURFACE LAYER ON TI/TI ALLOY HAVING HIGH RESISTANCE

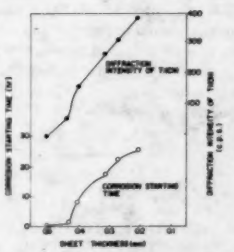
Kazuhiro Taki; Yasuhiro Mitsuyoshi, both of Samukawa, and Takeshi Shiraki, Yokohama, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,336

Claims priority, application Japan, Sep. 10, 1987, 62-226867; Apr. 28, 1988, 63-106149

Int. Cl.[4] C23C 11/10

U.S. Cl. 148—11.5 F 2 Claims



1. A process for producing a titanium material with excellent corrosion resistance, which comprises:

subjecting a titanium material to cold working while causing an oil to exist on the surface of the titanium material, the degree of said cold-working being 10% or more of the total working reduction;

and then subjecting the titanium material to heat treatment at 300° C. or higher temperatures to thereby react the titanium material with nitrogen and/or carbon contained in the oil to form a layer which excellent corrosion resistance containing at least one of the Ti_2N, TiC, and Ti(CN) on the titanium material surface.

4,908,073

METHOD OF PRODUCING A COLD ROLLED STEEL SHEET HAVING A GOOD AGEING RESISTANCE AND SMALL ANISOTROPY AND ADAPTED FOR DEEP DRAWING

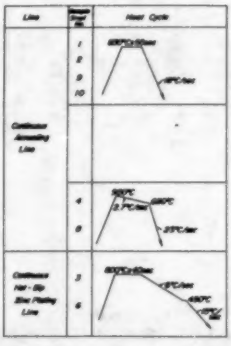
Susumu Sato; Osamu Hashimoto; Toshio Irie, and Nobuo Matsuno, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 898,889, Aug. 21, 1986, abandoned, which is a continuation of Ser. No. 693,327, Jan. 22, 1985, abandoned, which is a continuation of Ser. No. 478,525, Mar. 14, 1983, abandoned. This application Feb. 23, 1988, Ser. No. 161,315

Claims priority, application Japan, Aug. 10, 1981, 56-124936

Int. Cl.[4] C21D *9/48*

U.S. Cl. 148—12 C **4 Claims**



1. A method of producing a cold rolled steel sheet having good ageing resistance and small anisotropy and adapted for deep drawing, comprising selecting a cold rolled steel sheet having a composition comprising, in weight ratio, 0.03–0.30% of Mn, not more than 0.150% of P, not more than 0.020% of S, not more than 0.007% of N, 0-005–0.150% of acid-soluble Al, and further comprising C and at least one element selected from Nb, V, Zr and W in such amounts that the amount of C is not more than 0.0028% and the total amount of at least one element of Nb, V, Zr and W is 0.002–0.008%, and the remainder being Fe and incidental impurities, and subjecting the sheet to a continuous annealing at a temperature within the range of 800°–950° C., and successively subjecting the sheet to cooling within the temperature range of 700°–300° C. in less than 10 minutes without overageing.

4,908,074

GALLIUM ARSENIDE ON SAPPHIRE HETEROSTRUCTURE

Takashi Hosoi, and Kokichi Ishibitsu, both of Youkaichi, Japan, assignors to Kyocera Corporation, Kyoto, Japan

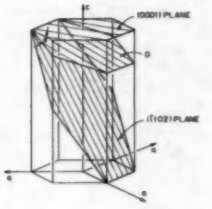
Continuation of Ser. No. 20,103, Feb. 27, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 281,937

Claims priority, application Japan, Feb. 28, 1986, 61-44973; Mar. 31, 1986, 61-75268

Int. Cl.[4] H01L *29/30, 29/12*

U.S. Cl. 148—33.2 **13 Claims**

1. A semiconductor element comprising a single crystal sapphire substrate and a film of a gallium-arsenic semiconductor formed on the substrate by the epitaxial growth, wherein the off angle to the epitaxial growth plane from the plane (0001) of the crystal of the sapphire substrate is greater or equal to 0.5° but smaller than 5°, the film of the gallium-arsenic semiconductor has a thickness of at least 1 μm and the surface of the film of the gallium-arsenic semiconductor has such a



smoothness that the maximum height roughness is smaller than 0.1 μm (smaller than 0.1 S).

4,908,075

SURFACE TREATMENT CHEMICAL FOR FORMING A HYDROPHILIC COATING

Katsuyoshi Yamasoe, Yotsukaido, Japan, assignor to Nippon Paint Company, Ltd., Osaka, Japan

Division of Ser. No. 90372, Aug. 28, 1987, Pat. No. 4,828,616. This application Feb. 7, 1989, Ser. No. 306,927

Claims priority, application Japan, Aug. 28, 1986, 61-202343

Int. Cl.[4] C23C *22/82*

U.S. Cl. 148—256 **7 Claims**

1. A method of treating an aluminum surface comprising the steps of:

(A) forming a phosphoric chromate or chromium chromate coating on said aluminum surface, and

(B) treating it with an aqueous surface treatment composition comprising

(i) alkali metal silicate,

(ii) at least about 0.5% aminoalcohol, and

(a) a water-soluble resin selected from the group consisting of nylon, a natural polysaccharide and a natural protein;

(b) a water-soluble silane coupling agent; or mixtures of said silane with anyone of the aforesaid resins;

(c) wherein said alkali metal silicate has a SiO_2/M_2O molar ratio of 0.5–3 and the concentration of SiO_2 is 0.1–1.0 weight %.

4,908,076

FE-B MAGNETS CONTAINING ND-PR-CE RARE EARTH ELEMENTS

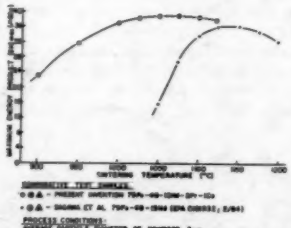
Kenzaburou Iijima, and Takeo Sata, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Continuation-in-part of Ser. No. 11,876, Feb. 6, 1987, abandoned, which is a continuation of Ser. No. 724,016, Apr. 17, 1985, abandoned. This application Dec. 2, 1987, Ser. No. 127,765

Claims priority, application Japan, Apr. 24, 1984, 59-82721

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—302 **4 Claims**



1. A rare earth magnet article consisting essentially of the

three rare earth elements Nd-Pr-Ce within defined atom ratios of each in the formula:

$$(Nd_{1-(p+q)}Pr_pCe_q)_xB_yFe_{1-(x+y)}$$

wherein $0.1 \leqq x \leqq 0.3$, $0.02 \leqq y \leqq 0.09$, $0.1 \leqq p \leqq 0.3$ and $0.02 \leqq q \leqq 0.15$;

said magnet having been prepared by melting said constituents into an alloy thereof, casting said molten alloy, comminuting said cast alloy into powders having an average diameter of 2.0 to 50 μm, compacting said powders within a magnetic field, and sintering said compacted powders at 950 degrees to 1200 degrees C. for at least 1 hour to 4 hours, the resultant magnet having a coercive force Hc of at least about 5kOe, and a residual magnetic flux density Br of at least about 10kG, which magnetic properties are substantially the same within the range of said sintering temperatures.

4,908,077

SCROLL MADE OF ALUMINUM ALLOY

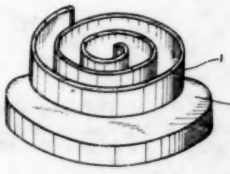
Kouji Nakamura; Yukiji Ohshima, both of Tokyo, and Hajime Kamio, Ihara, all of Japan, assignors to Oshida Patent Agency, Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,519

Claims priority, application Japan, Sep. 4, 1987, 62-220469

Int. Cl.[4] C22C *21/02*

U.S. Cl. 148—437 **6 Claims**



1. Compressor scrolls forged from an aluminum-silicon type alloy consisting essentially of 8.6 to 10.5% by weight of silicon the silicon being present as eutectic particles having an average particle diameter in the range of 2 to 8 μm, which particles are uniformly dispersed with a degree of dispersion is in the range of 10,000 to 30,000 particles/mm^2.

4,908,078

MATERIAL FOR CONDUCTIVE PARTS OF ELECTRONIC OR ELECTRIC DEVICES

Toshiki Muramatsu; Mamoru Matsuo; Shigeo Tsuchida, all of Fukaya, and Hiroyoshi Gungi, Tsuchiura, all of Japan, assignors to Sky Aluminium Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00758, § 371 Date May 27, 1988, § 102(e) Date May 27, 1988, PCT Pub. No. WO88/02788, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 8, 1987, Ser. No. 207,310

Claims priority, application Japan, Oct. 9, 1986, 81-240713

Int. Cl.[4] C22C *21/00*

U.S. Cl. 148—439 **15 Claims**

1. An electrical rolled strip of aluminum base alloy, consisting essentially of 0.3 to 4.0% by weight of manganese and 0.10 to 5.0% by weight of magnesium, the balance being aluminum, said electrical rolled strip having improved zincate processing, press forming, bending repeatability and etching properties.

4,908,079

WATER IN OIL TYPE EMULSION EXPLOSIVE

Yoji Tasaki; Akihiro Tanaka; Koichi Kurokawa; Katsuhide Hattori, and Motoyuki Amano, all of Chita, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 270,651, Nov. 14, 1988, abandoned. This application Jul. 6, 1989, Ser. No. 377,813

Claims priority, application Japan, Nov. 13, 1987, 62-285608; Aug. 25, 1988, 63-209523

Int. Cl.[4] C06B *45/00*

U.S. Cl. 149—2 **16 Claims**

1. A water in oil type emulsion explosive containing a continuous phase of a carbonaceous fuel, a dispersive phase of an aqueous solution of an inorganic oxidate, an emulsifier, and a foam retainer, wherein the carbonaceous fuel is a low molecular weight polyethylene of 20–80 carbon atoms not having a polar group at its terminal end, and having a melting point or softening point of 40°–120° C., a number average molecular weight of 350–1,000, and a density of 0.90–0.96.

4,908,080

WATER-IN-OIL TYPE EMULSION EXPLOSIVE WITH CHELATING AGENT

Tomoyuki Amano; Koichi Kurokawa, and Koji Edamura, all of Chita, Japan, assignors to Nippon Oil and Fats, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 232,099, Aug. 15, 1988, abandoned. This application Jul. 13, 1989, Ser. No. 379,687

Claims priority, application Japan, Aug. 25, 1987, 62-209126

Int. Cl.[4] C06B *45/00*

U.S. Cl. 149—2 **3 Claims**

1. A water in oil type emulsion explosive composed of a continuous phase consisting of a carbonaceous fuel, a dispersive phase consisting of an aqueous solution of an inorganic oxidative salt, an emulsifier, an auxiliary sensitizer, and a foam retainer, comprising further at least one chelating agent selected from the group consisting of tartaric acid, oxalic acid, ethylenediaminetetraacetic acid, and alkali metal salts and alkaline earth metal salts thereof; nitrilotriacetic acid, thioglycolic acid, ascorbic acid, sulfosalicyclic acid, and alkali metal salts thereof; triethanolamine, ethylenediamine, triethylenetetramine, acetylacetone, dihydroxyethylglycine, thiourea, diethyldithiocarbamine, diaminobenzene, 2,3-dimercapto propanol, o-phenanthoroline, and pyrocatechol-3,5-disulfonate; in an amount of 0.1–10 wt % relative to the amount of the auxiliary sensitizer, said auxiliary sensitizer being a nitric acid salt of a compound of the general formula

$$X—NH_2$$

wherein X represents CH_3CONH_2,$CH_2CH_2NH_2$,CH_2CH_2OH, NH_2 or H_2NCNH and in an amount of 0.5–50 wt % in the emulsion.

4,908,081

PROCESS FOR PRODUCING A SLIDING BODY

Juergen Heinrich, Schoenwald; Axel Krauth, Selb; Karl-Heinz Victor, Castrop-Rauxel, and Heinz Peeken, Aachen, all of Fed. Rep. of Germany, assignors to Hoechst Ceramtec Aktiengesellschaft, Frankfurt and Pacific Wietz GmbH & Co. KG, Dortmund, both of, Fed. Rep. of Germany

Division of Ser. No. 568,122, Dec. 9, 1983, Pat. No. 4,714,257. This application Dec. 18, 1987, Ser. No. 135,036

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213378

Int. Cl.[4] B32B *18/00*

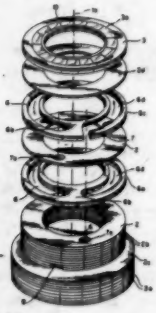
U.S. Cl. 156—89 **14 Claims**

1. A process for producing a sliding body particularly for sliding seals in which sliding surfaces of a sliding component and a counter component form a gap for fluid therebetween, said process comprising:

forming a plurality of thin form ceramic elements having

desired configurations which are cast from a ceramic slip containing organic components;

stacking the elements in a desired order to produce a sliding body assembly, at least one of said ceramic elements having a sliding surface on an axial face thereof formed by a thin ceramic membrane layer, said membrane layer covering at least two hollow chambers arranged adjacent to one



another in said sliding body assembly immediately beneath said membrane layer; and

sintering the elements solidly together at their contact faces to form a flexible and elastically deformable sintered ceramic membrane layer at said axial face covering said hollow chambers, whereby a friction reducing hydrodynamic effect may be produced at said sliding surface.

4,908,082

METHOD FOR IN-SITU REPAIR OF SOLVENT DEWAXING FILTER CLOTHS

Patrick C. Ewener, Sarnia, Canada; Duncan J. Bristow, Bridgewater, N.J.; Scott W. Armstrong, Sarnia, Canada; Louis C. Dallaire, Sarnia, Canada, and John A. Thompson, Wyoming, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jan. 13, 1989, Ser. No. 297,278

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—94 **25 Claims**

1. A method for the in-situ repair of damaged filter cloths used in solvent dewaxing filters, said method comprising the steps of:

(a) thoroughly washing the damaged area with oil/wax solvent to remove wax and oil therefrom;

(b) rinsing the washed area with a rinse solvent to remove the oil/wax solvent used in step (a) from the damage area;

(c) drying or evaporating the rinse solvent from the damage area;

(d) applying an epoxy based adhesive to the damage area thoroughly wetting the damage area; and

(e) curing the adhesive to effect the complete repair of the damage area.

3. The method of claim 1 or 2 wherein small, pre-cut pieces of filter cloth are inserted into the damage area following the application of adhesive of step (d) but prior to the curing of step (e), the quantity of filter cloth material inserted into the damage area being sufficient to close off the damage without creating a build up or bulge.

4,908,083

IMPACT-RESISTANT LAMINATE

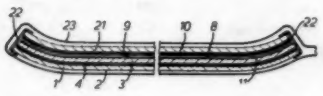
Christopher W. G. Hall, Redditch, England, assignor to Pilkington PLC, St. Helens, England

Continuation-in-part of Ser. No. 22,521, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 879,498, Jun. 24, 1986, abandoned, which is a continuation of Ser. No. 718,271, Apr. 1, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 114,405

Claims priority, application United Kingdom, Apr. 4, 1984, 8408664; Jan. 8, 1985, 8500471

Int. Cl.[4] B32B *17/00*; C03C *27/00*; G02C *7/00*

U.S. Cl. 156—99 **3 Claims**



1. A method of producing a curved, laminated impact-resistant panel comprising laminating together a plurality of glass sheets which are preformed to a curved shape and including an exposed front glass sheet and a rear glass sheet; and adhering to the rear glass face of the rear glass sheet a thin flexible polycarbonate sheet up to about 1 mm thick, which carries a self-healing polyurethane coating up to about 0.5 mm thick, to match the curvature of the preformed rear glass face of the rear glass sheet without preforming said thin flexible polycarbonate sheet.

4,908,084

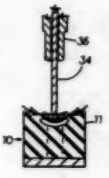
SUBSTRATE CONVERING METHOD AND APPARATUS

Kenneth Assink, 13395 Tyler St., Holland, Mich. 49424

Filed Nov. 18, 1988, Ser. No. 273,410

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—212 **32 Claims**



1. A method for covering a rigid or semi-rigid substrate comprising:

providing a mold having a mold cavity and a resiliently flexible lip overhanging and generally surrounding said mold cavity and defining an opening smaller in area than the area circumscribed by said substrate;

laying covering means over said mold;

pushing said substrate against said covering means and down into said mold past said flexible lip, deflecting said flexible lip downwardly;

allowing said flexible lip to flex back to its original position after said substrate and covering means have passed the same to thereby push a marginal edge portion of said covering means over the back of said substrate and place said marginal edge portion in a position to be sealed against said substrate.

4,908,085

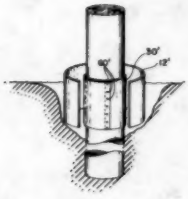
ARTICLE AND METHOD FOR WOOD PRESERVATIVE TREATMENT

Sharon J. Makus, and Warren L. Bennett, both of 11620 SE. 45th Pl., Bellevue, Wash. 98006

Division of Ser. No. 891,304, Jul. 28, 1986, Pat. No. 4,731,267. This application Mar. 8, 1988, Ser. No. 169,096

Int. Cl.[4] B65D *73/00*

U.S. Cl. 156—215 **6 Claims**



1. A method for applying a wrap around article for wood preservative treatment of wood poles, posts and the like, comprising the steps of:

(a) wrapping a generally rectangular, substantially flat, light weight, dry, oil absorbent pad of predetermined thickness around the circumference of the zone of said pole to be treated, and which pad is adapted to hold wood preservative solution, said pad being secured in place on said pole,

(b) applying a liquid wood preservative solution to said pad until said pad has absorbed the maximum amount of said solution, and

(c) applying a backing sheet of sufficient length around the circumference of said pole through the predetermined zone with some overlap thereof, said backing sheet being made of flexible plastic sheet which is also waterproof and which overlaps at it ends so that absorbent pad is generally completely covered by said backing sheet.

4,908,086

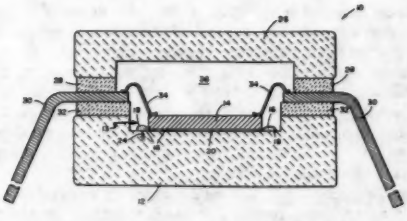
LOW-COST SEMICONDUCTOR DEVICE PACKAGE PROCESS

Gary B. Goodrich, and Jadish G. Belani, both of Cupertino, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 24, 1985, Ser. No. 747,713

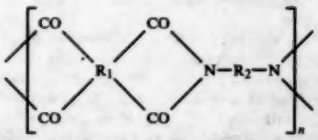
Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—181 **3 Claims**



1. A process for encapsulating a semiconductor die, which comprises:

adding an alkylaminotrialkoxysilane crosslinking agent to a crosslinkable resinous polyimide precursor which will cure to give a polyimide having a recurring unit of the formula:



in which R_1 and R_2 are radicals of a tetravalent aromatic group and a divalent aromatic group, respectively, and n is a positive integer,

degassing the resulting composition,

applying the degassed composition to a substrate prior to gelling of the composition,

positioning the semiconductor die on the substrate,

curing the degassed composition to attach the semiconductor die to the substrate,

applying an enclosure over the semiconductor die on the substrate, and

hermetically sealing the attached semiconductor die by bonding the enclosure to the substrate over the semiconductor die through application of heat at a temperature of at least about 450° C.

4,908,087

METHOD OF FORMING A MULTILAYER PRINTED CIRCUIT BOARD AND APPARATUS THEREFOR

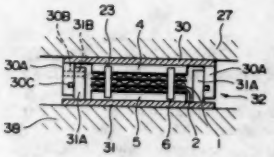
Hideyasu Murooka; Masayuki Kyooi; Osamu Yamada, all of Yokohama, and Noriaki Ujiie, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 909,227, Sep. 19, 1986, abandoned. This application Mar. 31, 1989, Ser. No. 332,377

Claims priority, application Japan, Sep. 20, 1985, 60-209733

Int. Cl.[4] B32B *31/12, 31/20, 31/22, 31/26*

U.S. Cl. 156—286 **3 Claims**



1. A method of forming a multilayer printed circuit board comprising the steps of:

placing a laminated assembly of a plurality of printed circuit board components and a plurality of prepregs of bonding agent alternately laminated on each other between an upper jig plate and a lower jig plate, and

applying heat and pressure to said laminated assembly in a thickness direction of said laminated assembly from upper and lower sides thereof through the upper and lower jig plates, thereby bonding said printed circuit board components and said prepregs with each other,

characterized by inserting said laminated assembly placed between said upper and lower jig plates into a space within a vacuum and high pressure applying means constituted by an upper plate and a lower plate each provided with an enclosing frame located around said laminated assembly and shiftably engaged with each other in the thickness direction of said laminated assembly and having sealing means for preventing leakage of gas through said enclosing frames, sufficiently evacuating said space within said vacuum and high pressure applying means,

thereafter heating and applying pressure to said laminated assembly in the thickness direction of said laminated assembly through the upper and lower jig plates, within said vacuum and high pressure applying means so as to melt

said prepregs for filling vacancies between patterns on said printed circuit board components with said bonding agent, and

pressurizing said space with a gas immediately after filling said vacancies with said bonding agent to a pressure above the vapor pressure of water and solvent contained in said bonding agent and maintaining the pressurization with said gas until said bonding agent solidifies, while continuing to apply pressure to said laminated assembly from upper and lower sides of the laminated assembly in the thickness direction thereof through the upper and lower jig plates, thereby permitting voids caused by air remaining in fine spaces between said printed circuit board components and said prepregs in said laminated assembly as well as voids generated by gasification of the water and the solvent in said bonding agent to be positively avoided.

4,908,088

EXTREME DAMAGE TOLERANT GRAPHITE COMPOSITES AND METHOD OF MAKING SAME

Jack D. Boyd, Westminster; William T. Mead, Irvine, and Theodore F. Biermann, Mission Viejo, all of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,073
Int. Cl.[4] C09J 5/02
U.S. Cl. 156—307.3 14 Claims

1. A process for the manufacture of a multi-layer heat-curable prepreg comprising:

(a) preparing a thermosetting, cyanate-functional resin-impregnated, fiber reinforced unilayer prepreg;

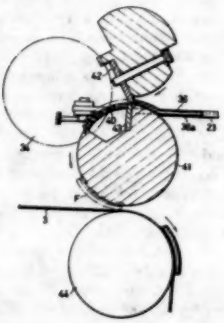
(b) laminating to said unilayer prepreg one or more films of an engineering thermoplastic by means of heat and pressure such that said thermoplastic becomes fused to said unilayer prepreg producing an integral multi-layer structure, wherein said thermoplastic film is a 0.5 mil to 0.7 mil film of an engineering thermoplastic.

4,908,089

APPARATUS FOR MAKING AN ELASTICIZED UNIT

Masashi Uda, Minoo, and Jun Oohira, Mitoyo, both of Japan, assignors to Toyo Eizai Kabushiki Kaisha, Kawance, Japan

Division of Ser. No. 68,222, Jun. 30, 1987, Pat. No. 4,776,911. This application May 20, 1988, Ser. No. 196,612
Claims priority, application Japan, Jun. 30, 1986, 61-153660; Nov. 11, 1986, 61-269423; Feb. 13, 1987, 62-31958
Int. Cl.[4] B65H 81/00
U.S. Cl. 156—439 10 Claims



1. An apparatus for making elastic fabric units, the apparatus comprising:

a pair of conveyors having a plurality of engagement means thereon for elastic strands;

rotative arm means for winding the strands around the conveyor,

means for providing tape members to opposite sides of said strands;

means for fixing a predetermined number of said strands to said tape members;

rolling means having sucking apertures disposed at the end of said pair of conveyors; and

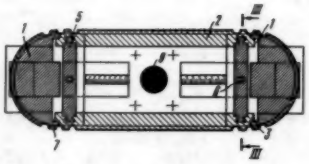
cutting means for cutting said elastic strands fixed to said tape members while said strands are secured by said sucking apertures.

4,908,090

APPARATUS FOR PRESSURE-FORMING AND CURING OF POLYMER PRODUCTS

Gennady G. Kozachevsky, ulitsa Yakubovskogo, 18, korpus 2, kv. 271.; Valery V. Guskov, ulitsa Kulman, 13, kv. 19.; Vladimir P. Bolkov, ulitsa Ya.Kolasa, 139, kv. 172., all of Minsk; Jury N. Gorodnichev, ulitsa Gertsena, 37, korpus 1, kv. 72., Moscow; Svetlana I. Sizova, ulitsa Ya.Kolasa, 139, kv. 172., Minsk; Viktor A. Moroz, ulitsa Kulbysheva, 8a, kv. 24., Bobruisk; Issak Y. Kachur, ulitsa M.Gorkogo, 28, kv. 62., Bobruisk; Alexandr S. Kholmovsky, ulitsa Minskaya, 63, kv. 88., Bobruisk, and Nadezhda V. Lapshina, ulitsa Lobachevskogo, 8, kv. 2., Moscow, all of U.S.S.R.

PCT No. PCT/SU86/00005, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04660, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 30, 1986, Ser. No. 130,539
Int. Cl.[4] F16G 5/00
U.S. Cl. 156—446 3 Claims



1. An apparatus for pressure-forming and curing of polymer products, said apparatus comprising:

two moulds, each of said moulds being a semicylinder having a flat side and a curved surface;

two spaced apart, parallel plates interlinking said two moulds such that the flat sides of the two moulds face each other, said parallel plates and said moulds forming a building core having a contoured outer surface, said contoured outer surface comprising the curved surfaces of said moulds and outer surfaces of said parallel plates, said building core being revolvable about a fulcrum pin having an axis of rotation so that material for a circular polymer product can be wound around said contoured outer surface of said building core;

means for setting a separating distance between said moulds in a direction perpendicular to the axis of rotation of the fulcrum pin; and

forming means comprising a girdling structure which circumferentially embraces said building core such that said girdling structure extends around the contoured outer surface of said building core, said girdling structure comprising at least two elements, at least one of said elements being radially displaceable.

4,908,091

SPLICING DEVICE FOR PACKAGING WEBS

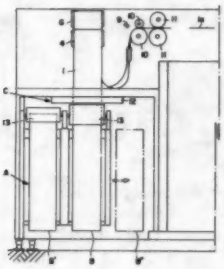
Paul Traegaardh, Tokyo, and Hans Nantin, Trelleborg, Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Mar. 8, 1988, Ser. No. 165,701

Claims priority, application Japan, Mar. 14, 1987, 62-59262

Int. Cl.[4] B65H *19/12, 19/18, 19/20*

U.S. Cl. 156—502 **17 Claims**



1. A splicing device for packaging webs comprising:

a shiftable magazine unit having a first and a second magazine, each of said magazine being capable of housing a roll of a web, said magazine unit being movable between a first and a second position, said magazine unit when in said first position having the first magazine in an on-line position and the second magazine in a first stand-by position, said magazine unit when in said second position having the first magazine in a second stand-by position and the second magazine in the on-line position, the web within the magazine in the on-line position being used while the web in the first or second stand-by position is held ready for subsequent use when moved to the on-line position, said magazine unit being moved when the web in use is terminated; and

splicing means for joining an end of the web in the magazine moved from either stand-by position to an end of the terminated web, said splicing means including first and second splicing units being located on said first and second magazines respectively, and said first and second splicing units being movable with said magazine unit.

4,908,092

APPARATUS FOR MOUNTING CHIP DEVICE ON PRINTED CIRCUIT BOARD

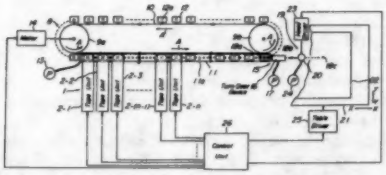
Masaaki Koibuchi, Naka, Japan, assignor to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,010

Claims priority, application Japan, Jan. 20, 1987, 62-10225; Jun. 6, 1987, 62-141914

Int. Cl.[4] B32B *1/00;* **B31F** *5/00;* **B23P** *19/00;* **B65G** *17/46*

U.S. Cl. 156—556 **23 Claims**



1. An apparatus for automatically mounting chip devices on a printed circuit board comprising

chip device supplying means for supplying chip devices one by one in an upside-down fashion in a predetermined order;

chip device feeding means for receiving and holding the chip devices supplied from the chip device supplying means with the aid of a suction force, while the chip devices are held in the upside-down fashion, feeding and indexing the chip devices thus held into a first transporting position, said feeding means comprising:

a suction chamber arranged horizontally and having a plurality of air suction holes formed in an upper surface thereof;

means for maintaining inside of said suction chamber a negative pressure; and

means for moving the chip devices along the upper surface of said suction chamber to said first transporting position, said means for moving the chip devices including a plurality of carriers each having a bottom surface slidable on the upper surface of said suction chamber and means for supporting said carriers during movement of said carriers;

turning-over means for receiving the chip device indexed at said first transporting position with aid of the suction force, turning over the chip device thus held and transporting the chip device into a second transporting position; and

mounting means for receiving the chip device indexed at said second transporting position with the aid of the suction force, transporting the chip device to a predetermined position adjacent the printed circuit board and placing the chip device on the printed circuit board.

4,908,093

FILM CONVEYING APPARATUS

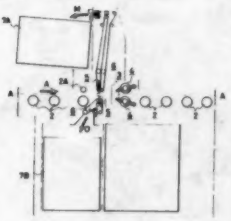
Sigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Feb. 5, 1987, Ser. No. 11,469

Claims priority, application Japan, Feb. 5, 1986, 61-23176; Feb. 24, 1986, 61-38880

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—584 **18 Claims**



1. A film conveying apparatus for conveying a film peeled from a laminate structure, the conveying apparatus comprising:

a conveyance means for conveying the peeled film and discharging the film in a film discharge direction; and

fluid spray means for spraying a fluid substantially in the film discharging direction of said conveyance means, wherein the conveyance means comprises a plurality of pairs of opposing conveyor belts for conveying the peeled film while held therebetween, at least two of said pairs of belts are aligned in a direction transverse to said conveyance direction, and said fluid spray means comprises a plurality of pipes having spraying holes formed therein, said pipes being disposed so as to extend in the transverse direction with said spraying holes disposed between said two of said pairs of belts, and said pipes extending through one of said conveyor belts in each of said two of said pairs.

4,908,094

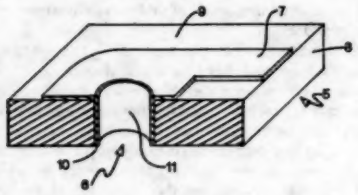
METHOD FOR LAMINATING ORGANIC MATERIALS VIA SURFACE MODIFICATION

Carol R. Jones, Binghamton, and Robin A. Susko, Owego, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 851,856, Apr. 14, 1986, Pat. No. 4,715,941. This application Sep. 8, 1987, Ser. No. 93,923

Int. Cl.[4] B32B *31/28*

U.S. Cl. 156—633 11 Claims



1. A method for making a laminate from two organic members, each having a first surface for interfacial contact, and at least one of the members selected from the group consisting of a silylated resin member and a member having silicon containing organic material deposited on the first surface, comprising the steps of:

roughening the silicon containing first surface of the at least one member by subjecting it to an oxygen containing plasma, and

pressing the roughened first surface together with the first surface of the other member.

4,908,095

ETCHING DEVICE, AND ETCHING METHOD

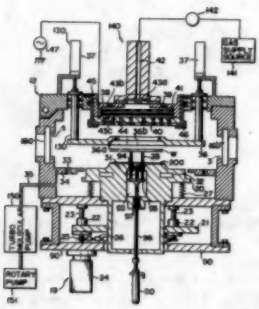
Satoshi Kagatsume, Nirasaki, and Kazuo Fukasawa, Kofu, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,709

Claims priority, application Japan, May 2, 1988, 63-109789

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; H01L *21/306*

U.S. Cl. 156—643 22 Claims



20. A method of etching an object held between first and second electrodes, which plasma generated between these electrodes, said method comprising the steps of:

supporting the object on said first electrode;

moving said first electrode, thereby to push the object onto a holding member located between said first and second electrodes, whereby the object is held by said holding member; and

generating plasma between said first and second electrodes, while supplying reaction gases into a gap between said first and second electrodes, thereby etching the object.

4,908,096

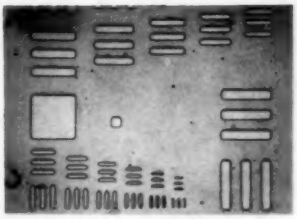
PHOTODEFINABLE INTERLEVEL DIELECTRICS

Joseph J. Zupancic, Bensenville, Ill., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 24, 1988, Ser. No. 211,018

Int. Cl.[4] B44C *1/22*; B29C *37/00*; C03C *15/00, 25/06*

U.S. Cl. 156—655 17 Claims



1. A method of selectively forming a patterned polymeric resin on a substrate comprising:

(a) coating a substrate with a prepolymer which is an oligomeric resin comprising ethers of the oligomeric condensation product of 1 molar proportion of a dialdehyde, with a dialdehyde selected from the group consisting of OHC(CH2)nCHO, where n=0 or an integer from 1 to 6, cyclopentanedione, cyclohexanedione, phthalaldehyde, isophthalaldehyde, terephthalaldehyde, hexahydrophthalaldehyde, cycloheptanedialdehyde, hexahydroisophthalaldehyde, hexahydroterephthalaldehyde, and cyclooctanedialdehyde, with from about 3 to about 4 molar proportions of a phenol of structure $R_1C_6H_4OH$ where R_1 is hydrogen or an alkyl group containing from 1 to about 10 carbon atoms, and where the ether moiety is randomly selected from the group consisting of vinylbenzyl, alkyl moieties containing from 1 to 10 carbon atoms, cycloalkyl moieties of 5 to 10 carbon atoms, and benzyl, with the ratio of vinylbenzyl to other moieties being from 1:1 to about 6:1;

(b) irradiating the prepolymer coating through a masking pattern so as to selectively crosslink portions of the coating being irradiated;

(c) selectively dissolving the non-irradiated parts of the prepolymer coating; and

(d) curing the patterned photochemically crosslinked portion of the prepolymer coating by heating said portion at a temperature greater than about 110° C. for a time sufficient to further crosslink said coating and transform the prepolymer to an infusible glassy solid.

4,908,097

MODIFIED CELLULOSIC FIBERS

Larry Box, Glen Mills, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 40,960, Apr. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 763,301, Aug. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 576,828, Feb. 3, 1984, abandoned. This application Oct. 26, 1988, Ser. No. 265,359

Int. Cl.[4] D21C *9/00, 9/153*

U.S. Cl. 162—9 11 Claims

1. A method for preparing modified cellulosic fibers which comprises the steps of:

(a) applying up to 5% of N,N-methylenebiscarylamide by dry weight of said fibers;

(b) applying an amount of alkali equivalent in alkali strength to up to ten parts sodium hydroxide to fiber by weight;

(c) maintaining the consistency of said fibers at at least 10% so that a continuous aqueous phase around said fibers is absent and maintaining the temperature of said treated fibers below the boiling point of water throughout step (a) or (b) whichever is performed later, if performed sepa-

rately or throughout steps (a) and (b) if performed simultaneously; and

(d) excluding free radical initiators and air from the fibers treated in accordance with steps (a) and (b) until the modification reaction is complete.

4,908,098

METHOD FOR EXTRACTING THE CHEMICAL COMPONENTS FROM DISSOCIATED LIGNOCELLULOSIC MATERIAL

Edward A. DeLong; Edward P. DeLong, both of Sherwood Park; George S. Ritchie, Winterburn, and W. Alan Rendall, Calgary, all of Canada, assignors to Tigney Technology Inc., Canada

Continuation of Ser. No. 55,142, May 27, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,917

Claims priority, application Canada, May 29, 1986, 510262

Int. Cl.[4] C07G *1/00*; D21C *3/02, 3/20, 3/26*

U.S. Cl. 162—16 **13 Claims**

1. A method of extracting chemical components from dissociated lignocellulosic material with small volumes of solvent comprising:

(a) placing said dissociated lignocellulosic material to a predetermined height in a column having an upper opening and a lower opening;

(b) adding water through said upper opening and, without agitating the contents of the column, permitting said water to percolate down through said dissociated lignocellulosic material in a plug flow and dissolve water-soluble substances;

(c) removing said water and dissolved substances through said lower opening;

(d) adding a suitably selected alcohol through said upper opening and, without agitating the contents of said column, allowing said alcohol to percolate down through said dissociated lignocellulosic material and dissolve alcohol-soluble substances;

(e) removing said alcohol and dissolved substances through said lower opening;

(f) adding a dilute aqueous caustic solution which will not swell the said dissociated lignocellulosic material sufficient to impede the flow of said caustic solution through said upper opening and, without agitating the contents of the column, permitting said caustic solution to percolate down through said dissociated lignocellulosic material in a plug flow and dissolve substances in said caustic solution; and

(g) removing said caustic solution and dissolved substances through said lower opening; and wherein the said water, said alcohol and the said caustic solution are at a temperature of 65° C. or less and a head of each is maintained during said adding steps (b), (d) and (f) such that the head is at least above the level of the said material in the column and the column is substantially unpressurized, and wherein no more than about 2 column volumes of said water, alcohol and caustic solution are used for said extractions.

4,908,099

PROCESS TO DISSOCIATE AND EXTRACT THE LIGNIN AND THE XYLAN FROM THE PRIMARY WALL AND MIDDLE LAMELLA OR LIGNOCELLULOSIC MATERIAL WHICH RETAINS THE STRUCTURAL INTEGRITY OF THE FIBRE CORE

Edward A. DeLong, 439-22560 Wye Road, Sherwood Park, Alberta, Canada (T8A 4T6)

Filed Sep. 19, 1988, Ser. No. 246,064

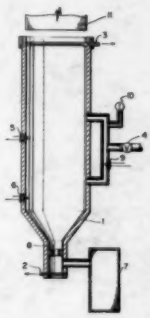
Int. Cl.[4] D21B *1/36*

U.S. Cl. 162—21 **20 Claims**

1. A method of producing mechanically intact but separated lignocellulosic fibre cores comprising:

(a) packing lignocellulosic material having substantially uniform lengths of heat transfer paths and being in a moist form in a pressure vessel having a valved outlet, and

(b) with the valve closed, rapidly filling the pressure vessel with steam at a pressure of at least 130 psi to bring, by means of the pressurized steam, substantially all of the lignocellulosic material to a temperature in the range of 160 to 175 degrees celcius in less than 60 seconds and, at a temperature within said range wherein lignin and xylan



components of the lignocellulosic material are softened but cellulose components of the lignocellulosic material are not softened, opening the valved outlet and instantly and explosively expelling the lignocellulosic material from the pressure vessel to cause the thermally softened lignin xylan crosslinks in the middle lamella and primary wall to be fractured while retaining the full structural integrity of the cellulose in the fibre cores.

4,908,100

HYDROLYZED POLYACRYLAMIDE BLENDS AS STARCH RETENTION AIDS

W. E. Hunter, Pittsburgh, and Ronald J. Falcione, Canonsburg, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1989, Ser. No. 310,415

Int. Cl.[4] D21H *3/38*

U.S. Cl. 162—168.3 **2 Claims**

1. A method of improving starch retention in papermaking comprising adding an effective amount of composition comprising:

(a) a polymer having a molecular weight of from about 2,000,000 to about 8,000,000 which comprises from about 5 to about 50%, by weight, of acrylic acid or methacrylic acid and from about 50 to about 95%, by weight, of acrylamide or methacrylamide; and

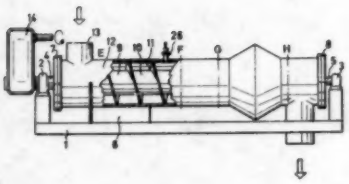
(b) a polymer having a molecular weight of from about 10,000,000 to about 20,000,000 which comprises from about 5 to about 50%, by weight, acrylic acid or methacrylic acid and from about 50 to about 95%, by weight, of acrylamide or methacrylamide; to an aqueous papermaking stock solution containing starch, wherein the weight ratio of (a):(b) ranges from about 95:5 to about 5:95, on an active basis.

4,908,101

METHOD AND APPARATUS FOR MIXING CHEMICALS INTO FIBER PULP

Edvin Frisk, Järved; Per-Olof Frisk, Arn',uml/a svall, and Arne Lindahl, Domsjö, all of Sweden, assignors to Hedemora AB, Hedemora, Sweden

Filed Nov. 12, 1987, Ser. No. 119,703
Claims priority, application Sweden, Nov. 18, 1986, 8604918
Int. Cl.[4] B02C *19/22*
U.S. Cl. 162—261 6 Claims



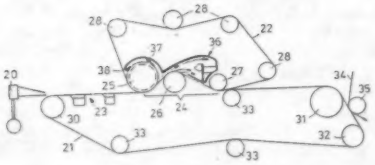
1. An apparatus for mixing chemicals into ligno-cellulose materials, comprising fixed substantially horizontal casing, rotatable means within the casing, the rotatable means and casing together defining a flow space surrounding the rotatable means for providing a pulp flow path through the apparatus, first inlet means for admitting pulp to be treated to said space adjacent one end of said casing, outlet means for treated pulp positioned adjacent an opposite end of said casing, the casing defining at least three different treatment sections between the first inlet means and the outlet means, the rotatable means in first of said treatment sections which is positioned closest to the first inlet means including transport means for transporting the pulp to subsequent ones of the treatment sections with increased pressure, second inlet means for the supply of chemicals to said flow space in said first of said treatment sections, one of said subsequent treatment sections being provided in said flow space with guide means fixed on said casing and guide means fixed on said rotatable means for forming, upon rotation of aid rotatable means, a pulp flow channel between an entrance and an exit of said one of the subsequent treatment sections, said guide means fixed on the rotatable means extends outwardly towards the casing and said guide means fixed on the casing extends inwardly towards said rotatable means, said guide means fixed on the casing alternates in position along the length of said casing with respect to said guide means fixed on the rotatable means along the length of said rotatable means, thereby providing a shearing of the pulp during mixture of the pulp with chemicals supplied through said second inlet means, and another of said subsequent treatment sections having a first part with means for imparting to the pulp in said flow space a retarding velocity in a flow direction of the pulp and a second part positioned downstream of said first part with means for imparting to the pulp in said flow space an accelerating velocity in said flow direction, thereby providing pulses consisting of compressions and expansion of the pulp and velocity variations in the flow direction of the pulp.

4,908,102

DEVICE FOR CONTINUOUSLY DEWATERING A FIBER WEB

Heinz Zag; Albrecht Meinecke, both of Heidenheim; Otmar Kolb, Königsbronn; Josef Müllner, Heidenheim; Elemer Csordas, Heidenheim, and Dieter Egelhof, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH., Fed. Rep. of Germany

Continuation of Ser. No. 433,205, Sep. 30, 1982. This application Aug. 16, 1984, Ser. No. 641,409
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107730; Jun. 11, 1981, 3123132
Int. Cl.[4] D21F *1/66*
U.S. Cl. 162—264 34 Claims



1. A device for continuous dewatering of a web of fiber material in a paper making machine comprising:

(a) an endless porous belt for water to pass through, the belt forming a loop; horizontally oriented guide rolls for guiding and moving the belt around said guide rolls; a second belt cooperating with the first mentioned belt, the belts forming a twin-belt zone; the said fiber web to be dewatered being guided between the belts;

(b) said twin-belt zone being located in the lower region of the first belt;

(c) the guide rolls defining such a path for the belts and causing the belts to move at such speed that at least part of the water which has been removed from the said fiber web in the twin-belt zone penetrates through the first belt and is thrown off the first belt from below upwards into the interior of said loop

(d) one of the guide rolls for the first belt being a dewatering roll which is located inside said loop in the twin-belt-zone;

(e) the dewatering roll being located in the lower region of the path of the first belt; the first belt therefore passing at least predominantly around the bottom side of the dewatering roll;

(f) the dewatering roll including an external shell with recesses defined in the shell which receives water from the first belt in the region where the first belt is wrapped around the dewatering roll, and beyond where the belts are guided off the dewatering roll, the said dewatering roll throwing off water from below upwards into the interior of said loop;

(g) a container placed inside said loop for receiving water thrown off the first belt and off said dewatering roll;

(h) the container being divided into two separate water containing chambers, each chamber extending across the width of the belts; each chamber extending across the width of the belts; each chamber having a water exit therefrom individual thereto;

(i) the exit from one chamber being at one lateral side of the container and the exit from the other chamber being at the opposite lateral side of the container; each container being shaped so that the respective inside width of each chamber, measured along the path of the belt, increases laterally along the container in the direction toward the respective exit from that chamber;

(j) a guide wall above the area from which the water is thrown, said guide wall being positioned to be struck by the water thrown off the first belt and off said dewatering roll and directing the thrown off water into the container;

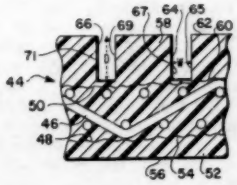
(k) the guide wall being shaped and postioned to direct the more dense jets of water into one of the chambers of the container; the remaining water passing into the other chamber.

4,908,103

BEARING BLANKET FOR AN EXTENDED NIP PRESS HAVING LAMINATES OF DIFFERENT HARDNESSES

Dennis C. Cronin, Rockton, Ill., and David V. Lange, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

PCT No. PCT/US85/01953, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986
PCT Filed Oct. 3, 1985, Ser. No. 854,589
Int. Cl.[4] D21F 3/02
U.S. Cl. 162—358 12 Claims



1. A bearing blanket (44) for use in an extended nip press (12) in which the blanket (44) and felt (14) and a formed web (16) pass through an extended nip (18) defined by a rotatable press roll (20) and a cooperating hydraulically loaded shoe (22), said blanket (44) comprising in combination:

a base (46) for imparting inherent rigidity to the blanket (44), said base (46) having a first and a second side (48,50);

a first laminate (52) extending along said first side (48) of said base (46), said first laminate (52) having an interface (54) disposed contiguous with said first side (48) of said base (46) and a face (56) which cooperated with the hydraulically loaded shoe (22) of the extended nip press (12);

a second laminate (58) extending along said second side (50) of said base (46), said second laminate (58) having a surface (60) disposed contiguous with said second side (50) of said base (46), said second laminate (58) defining a boundary (62) such that said boundary (62) cooperates with the felt (14) of the extended nip press (12), said second laminate (58) defining a plurality of recesses (64,66) extending from said boundary (62) towards said base (46) for channeling fluid flow (68) from the felt (14) during passage of the blanket (44), felt (14) and web (16) through the extended nip (18); and

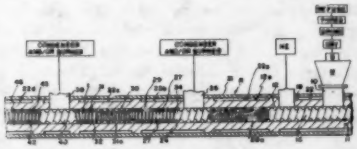
said laminates (52,58) having a hardness differential relative to each other, said first laminate (52) having a hardness within the range 80 to 93 Shore "A" for permitting flexing of said first laminate (52) during said passage through said extended nip (18), said second laminate (58) having a hardness of at least 99 Shore "A" such that crushing of said recesses (64,66) during said passage through said extended nip (18) is inhibited so that said fluid flow (68) is unimpeded.

4,908,104

METHOD OF CONTINUOUSLY CARBONIZING A MIXTURE OF PRIMARILY ORGANIC WASTE MATERIAL

Bernard A. Loomans; James E. Kowalczyk, both of Saginaw; Harold A. Lange, Freeland, and Jerry W. Jones, Bay City, all of Mich., assignors to APV Chemical Machinery Inc., Saginaw, Mich.

Filed Dec. 28, 1988, Ser. No. 291,131
Int. Cl.[4] C10B 53/02, 57/14
U.S. Cl. 201—25 17 Claims



15. A higher BTU friable dry char produced by continuously carbonizing a mixture of primarily organic waste material which principally includes paper, garbage, and a minor proportion of synthetic plastic material, and reducing it to a useful combustible char product wherein the steps followed are:

a. continuously feeding a stream of the contaminated waste material with a substantial organic materials content, into one end of a continuous mixer having an axially extending elongate barrel, housing axially extending mixer shafts;

b. progressively compressing the material fed into said one end of the mixer by advancing the material continuously through material conveying and compressing elements on the shafts which leave a reduced volume of space in the barrel for the material to the extent of forming a moving barrel-filling mass of material functioning as a first vapor block in a first region of said barrel, and utilizing the work energy imparted to the material required to squeeze out entrapped air in the material to raise the temperature of the material;

c. venting air squeezed out from said first region in a first vent zone upstream of the first vapor block;

d. continuing to advance the material downstream from said first vapor block in a further downstream vent zone having a vent by advancing it through mixing and material conveying elements on said shafts and decompressing the material to provide a traveling mass which does not so fill the barrel as to be forced out the vent in said further downstream vent zone;

e. progressively compressing the material downstream from said further downstream vent zone in the substantial absence of air in a further downstream region by passing it through material conveying and compressing elements on said shafts which leave a relatively reduced volume of space in the barrel for the material to the extent of forming a mass of moving material filling the barrel and functioning as another vapor block, while working the material against itself to create heat in the material which raises the temperature of the material adiabatically, without applying any material external heat to the mixer for transfer to the moving material, to a volatile releasing and material carbonizing temperature in the range 450° F.–600° F.;

f. venting volatiles from said vent in said further downstream vent zone;

g. and discharging a friable particulate char from said further downstream region.

16. A method of continuously carbonizing a mixture of primarily organic waste material which principally includes paper, garbage, and a minor proportion of synthetic plastic material, and reducing it to a useful combustible char product comprising the steps of:

a. continuously feeding a stream of the comminuted waste

material with a substantial organic materials content, into one end of a continuous mixer having an axially extending elongate barrel, housing axially extending, co-rotating mixer shafts;

b. contacting the material with material advancing elements on said shafts to advance the material fed into said one end of the mixer continuously through a first mixer region;

c. progressively compressing the material in the substantial absence of air in a downstream compression region by passing it through material conveying and compressing elements on said shafts which leave a relatively reduced volume of space in the barrel for the material to the extent of forming a mass of moving material filling the barrel and functioning as a vapor block, while working the material against itself to create heat in the material which raises the temperature of the material adiabatically to a volatile releasing and material carbonizing temperature, without applying any material external heat to the mixer for transfer to the moving material;

d. venting volatiles from said downstream region;

e. and discharging the carbonized product as a burnable char from said downstream region.

4,908,105

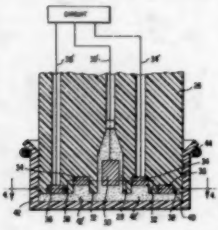
FLOW-COMPENSATED ELECTROCHEMICAL CELL AND METHOD OF ANALYSIS

William Garner, Jr., Austin, Tex., assignor to Hydrolab Corporation, Austin, Tex.

Filed Feb. 15, 1985, Ser. No. 703,677

Int. Cl.[4] G01N *27/30, 27/50*

U.S. Cl. 204—1 T **7 Claims**



1. An instrument for chemical analysis comprising body means for supporting a first electrode having a first polarity and a plurality of second electrodes having a second polarity with respect to said first electrode, and electrolyte means for passing electrical current between said first and second electrodes wherein the rate of passage of a substance to at least one of said second electrodes is different from the rate of passage of said substance to another of said second electrodes, and computation means connected to said first and second electrodes for combining signals from each of said second electrodes and correcting said signals to produce a single flow-insensitive output representative of said substance.

2. A method for chemical analysis comprising providing a first electrochemical cell for measuring concentration of a substance in a medium and having a first flow sensitivity to the velocity of flow of said medium past said first cell and a second electrochemical cell for measuring the concentration of said substance in said medium and having a second flow sensitivity to the velocity of flow of said medium past said second cell, placing said first and second cells in said medium in close proximity to each other and combining values representative of the concentration of the substance produced by each of said cells to provide a measurement of said concentration which is not sensitive to said velocity of flow.

4,908,106

ELECTROPLATING OF FINE PARTICLES WITH METAL

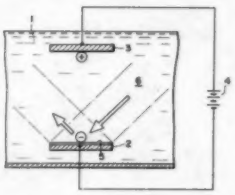
Eiki Takeshima; Kiyoshi Takatsu, both of Chiba; Youichi Kojima, Hyogo, and Takahiro Fujii, Chiba, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,670

Claims priority, application Japan, Apr. 25, 1988, 63-100204

Int. Cl.[4] G25D *5/00*

U.S. Cl. 204—23 **3 Claims**



1. A process for electroplating fine particles with metal by suspending electrically conductive fine particles in a metallic ion-containing electrolyte in an electroplating bath equipped with a cathode and anode, and passing a direct electric current between the cathode and anode thereby depositing metallic ions in the electrolyte on surfaces of the fine particles,

wherein said fine particles have a size of from 0.1 to 10 μm,

wherein a flow of a suspension of said fine particles in the electrolyte continuously flowing is forcibly formed in said bath while keeping said fine particles in the suspended condition in said electrolyte,

wherein said flow of said suspension is controlled so that its main direction of flow in the bath is such that while said suspension is circulated substantially without coming in collision with said anode, said fine particles in said suspension may have a chance of colliding with substantially all surface areas of said cathode that are exposed to said bath, and

wherein a flow rate and particle concentration of said suspension are controlled so that said fine particles may repeatedly come in collision with said cathode at a velocity with a normal component of ranging from 0.6 to 6.0 m/min., and a particle concentration of said suspension at the time of collision is from 30 to 55% by volume.

4,908,107

PROCESS FOR PREPARING FLUORINATED VINYL ETHERS

Steffen Dapperheld, Kriftel; Werner Schwertfeger, Langgöns, and Manfred Wildt, Brombachtal, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 202,127

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718726

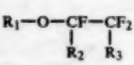
Int. Cl.[4] C25B *3/00*

U.S. Cl. 204—59 F **19 Claims**

1. A process for preparing compounds of the formula

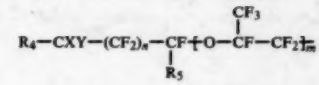
(I) $R_1—O—CF=CF_2$

by elimination of halogen atoms from compounds of the formula



(II)

in which



which comprises electrolyzing the compounds of the formula (II) in an undivided or divided electrolysis cell in an organic liquid which can also contain water at a temperature of −20° C. to the boiling temperature of the electrolyte or catholyte at a current density of 1-500 mA/cm^2 at a cathode composed of lead, cadmium, zinc, copper, tin, zirconium, mercury, alloys of these metals or carbon.

4,908,108

ELECTROLYTIC OXIDATION OF CERIUM 3+ VALUES TO CERIUM 4+ VALUES

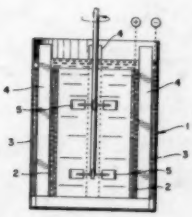
Dominique Horbez, Nancy; Alain Storck, Jarvielle La Malgrange, and Jean Grosbois, L'Isle Adam, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 9, 1989, Ser. No. 321,094

Claims priority, application France, Mar. 9, 1988, 88 03021

Int. Cl.^{4} C25B *1/00*

U.S. Cl. 204—93 **24 Claims**



1. A process for the conversion of cerous 3+ values into ceric 4+ values, which comprises providing a zone of electrolysis which includes an anode and a cathode emulsifying an organic phase comprising a cerium 4+ extractant in an aqueous sulfuric phase comprising the cerium 3+ values to be converted; simultaneously in said zone of electrolysis, electrolytically oxidizing said cerium 3+ values into cerium 4+ values and extracting said cerium 4+ values thus formed into said organic phase; separating the resulting emulsified organic phase and aqueous sulfuric phase into an aqueous phase and an organic phase enriched in cerium 4+ values; and recovering said organic phase enriched in cerium 4+ values.

4,908,109

ELECTROLYTIC PURIFICATION SYSTEM UTILIZING RAPID REVERSE CURRENT PLATING ELECTRODES

Francis C. Wright, Yardville, N.J., assignor to Mercer International, Inc., Mendham, N.J.

Continuation-in-part of Ser. No. 790,847, Oct. 24, 1985, Pat. No. 4,732,661. This application Mar. 22, 1988, Ser. No. 171,684

Int. Cl.^{4} C02F *1/46*

U.S. Cl. 204—149 **22 Claims**

1. A process for removing foreign matter from water in which it is suspended, comprising the steps of:

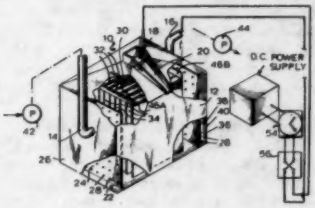
A. providing a plurality of electrodes adjacent to each other to form electrolysis-cell sections therebetween, the electrodes being adapted for application of a potential difference thereto when the electrodes are immersed in water to cause electric current to flow between adjacent electrodes through the water between them;

B. flowing water having foreign matter suspended therein through the electrolysis cell;

C. impressing a potential difference between adjacent electrodes to cause electric current to flow therebetween with a density of less than 100 amperes per square meter to electrolyze the water forming hydrogen and oxygen bubbles so that the bubbles coat the suspended foreign matter, causing the foreign matter to float to the surface of the water;

D. separating the foreign matter at the water surface from the water below, thereby reducing the concentration of foreign matter in the water;

E. protecting the electrodes from the effects of anodic destruction and scale and scum formation by periodically reversing the direction of the electric current flowing between adjacent electrodes for a predetermined period of time, allowing the current flowing between adjacent electrodes to electrolyze the water forming hydrogen and oxygen bubbles to coat the suspended foreign matter, said predetermined period of time is less than the time required for oxide formed on the electrodes to release into the water, so that when the direction of the current is reversed the oxide formed due to anodic breakdown is reduced back to the surface of the electrode while said electrode is a cathode; and,



F. continuing to repetitively reverse the direction of the current for said predetermined time to repeat the process. whereby the electrodes are protected from the effects of anodic destruction and scale and scum formation while efficiently removing foreign matter from the water.

4,908,110

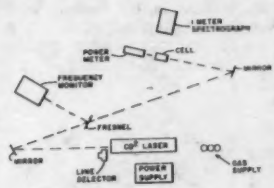
LASER-INDUCED NITRATION

Ann E. Stanley, and Susan E. Godbey, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 17, 1989, Ser. No. 340,815

Int. Cl.^{4} B01J *19/08*

U.S. Cl. 204—157.61 **5 Claims**



1. A method for the laser-induced nitrations of hydrocarbons to selectively nitrate said hydrocarbons toward specific nitrated hydrocarbon end products required for propellants with the chemical composition necessary to burn exactly with high energy production without producing undesirable smoke as a result of side products formed during said selectively nitration including a minimum of decomposition products formed as a result of low absorption threshold by said nitrated end products for said wavelength employed to selectively nitrate said hydrocarbons, said method comprising completing the laser-induced chemical reaction between a first resctant selected

from the hydrocarbons consisting of propane, n-butane, and n-pentane and a second reactant of a nitrating compound selected from nitrogen dioxide and nitric acid to form said nitrated hydrocarbons in accordance with completing the following steps and procedures which comprise:

(i) providing a stainless steel reaction cell adapted for use with vacuum line techniques and equipped with O-ring seals for securing ZnSe windows onto said reaction cell for transmitting laser radiation and for securing potassium chloride windows onto said reaction cell to achieve monitoring of said laser-induced chemical reaction including the reaction products formed;

(ii) metering said first reactant of said hydrocarbon and said second reactant of said nitrating compound into said reaction cell to form a reaction mixture of said hydrocarbons in the range from about 200 to about 500 torr and of said nitrogen dioxide or nitric acid in the range from about 20 to about 30 torr;

(iii) irradiating said reaction mixture with infrared laser radiation in the range of 10.4 or 9.4 micrometers as provided by a continuous-wave CO_2 laser operating in a predetermined single line operation with an output power from about 75 watts per centimeter square (W/cm^2) to about 82 watts per centimeter square (W/cm^2) to form said nitrated hydrocarbon end products; and,

(iv) recovering said nitrated hydrocarbon end products.

4,908,111

PROCESS FOR THE PREPARATION OF 7-(2-DIETHYLAMINOETHYL)-THEOPHYLLINE ACETYL SALICYLATE AND USE THEREOF

Concepción Coma Juliá, Barcelona, Spain, assignor to Laboratories Boi, S.A., Barcelona, Spain

Filed Feb. 28, 1989, Ser. No. 316,872

Claims priority, application Spain, May 5, 1988, 8801377

Int. Cl.[4] B01J *19/08*

U.S. Cl. 204—157.62 **3 Claims**

1. A process for the preparation of 7-(2-diethylaminoethyl)-theophylline acetylsalicylate, characterised in that it comprises the steps of forming a solution of acetylsalicylic acid and 7-(2-diethylaminoethyl)-theophylline in an inert solvent, filtering said solution through a layer of diatomaceous earth and activated carbon, to give a filtered solution, cooling said solution to a temperature lying between 1° and 8° C. and treating said solution with an ultrasound source at a frequency lying between 40 and 60 KHz.

4,908,112

SILICON SEMICONDUCTOR WAFER FOR ANALYZING MICRONIC BIOLOGICAL SAMPLES

Salvatore J. Pace, Wilmington, Del., assignor to E. I. Du Pont De Nemours & Co., Wilmington, Del.

Filed Jun. 16, 1988, Ser. No. 207,535

Int. Cl.[4] B01D *15/08*

U.S. Cl. 204—299 R **23 Claims**

1. An improved separation device, comprising a capillary sized, closed conduit adapted to be filled with liquid or solid materials for electrophoretic and/or chromatographic separations, means to introduce a sample to be processed into the conduit, the device characterized by

a semiconductor slab having a channel in one face and a cover plate attached to the one slab to form the closed conduit, adapted to receive an ionizable liquid, and means for applying an electric potential along the length of the interior of the conduit.

4,908,113

APPARATUS FOR THE ELECTROCHEMICAL SEPARATION OF OXYGEN

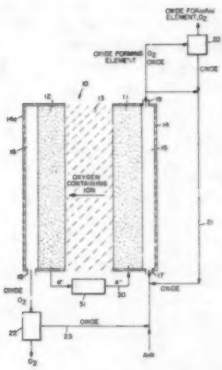
Leonard G. Marianowski, South Holland, and Robert J. Remick, Bolingbrook, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Division of Ser. No. 160,242, Feb. 25, 1988, Pat. No. 4,859,296, which is a continuation-in-part of Ser. No. 91,716, Sep. 1, 1987, Pat. No. 4,738,760. This application Jun. 12, 1989, Ser. No. 364,863

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[4] C25B *1/02*

U.S. Cl. 204—243 R **7 Claims**



1. An electrochemical oxygen concentration cell comprising: spaced porous electrodes each in contact with an electrolyte on one side and a gas chamber on the other side, said electrolyte comprising oxygen containing molten inorganic salt retained in a porous matrix between two said spaced porous electrodes.

4,908,114

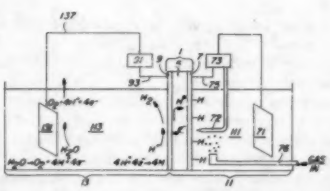
MOBILE ATOM INSERTION REACTION, MOBILE ATOM TRANSMISSIVE MEMBRANE FOR CARRYING OUT THE REACTION, AND REACTOR INCORPORATING THE MOBILE ATOM TRANSMISSIVE MEMBRANE

William Ayers, P.O. Box 5357, Princeton, N.J. 08876

Division of Ser. No. 780,870, Sep. 27, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 117,298

Int. Cl.[4] C25B *13/00, 9/00, 11/00*

U.S. Cl. 204—252 **49 Claims**



1. A bipolar atom transmissive membrane for hydrogen insertion reactions comprising:

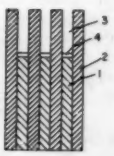
(a) a membrane comprising atom permeable, molecular impermeable, atom pump material, said membrane having a hydrogen insertion reaction side and a hydrogen receiving side;
(b) electrically conductive, atom permeable, biasing means on the hydrogen insertion reaction side of said membrane to control the surface potential thereof;
(c) electrically conductive, atom permeable biasing means on the opposite, hydrogen receiving side of said membrane;
(d) a first power source connected to said biasing means on said hydrogen insertion reaction side; and,
(e) a second power source connected to said biasing means on said hydrogen receiving side.

4,908,115

MINUTE ELECTRODE FOR ELECTROCHEMICAL ANALYSIS

Kenichi Morita, and Yoshihiro Shimizu, both of Kanagawa, Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP87/00252, § 371 Date Feb. 22, 1988, § 102(e) Date Feb. 22, 1988, PCT Pub. No. WO87/06701, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 21, 1987, Ser. No. 143,154
Claims priority, application Japan, Apr. 22, 1986, 61-92676
Int. Cl.[4] G01N *27/46*; C25B *11/12*
U.S. Cl. 204—294 **12 Claims**



1. A minute electrode for electrochemical analysis characterized in that it is comprised of a bundle of carbon fibers covered with a nonconducting resin, wherein ends of said carbon fibers are recessed from one end of the resin and wherein micro-holes extending to the outside in the direction of the longitudinal axis of the bundle of fibers are provided.

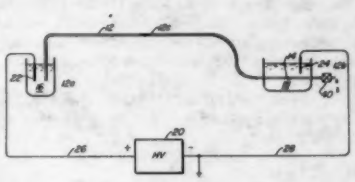
4,908,116

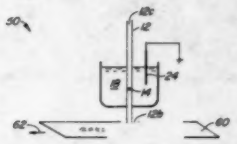
CAPILLARY ELECTROPHORETIC DEVICE EMPLOYING STRUCTURE PERMITTING ELECTRICAL CONTACT THROUGH IONIC MOVEMENT

Richard N. Zare, Stanford; Xiaohua Huang, Atherton, and Raymond T. Huckaby, San Jose, all of Calif., assignors to The Board of Trustees at the Leland Stanford Junior University, Stanford, Calif.

Filed Jun. 1, 1989, Ser. No. 359,512
Int. Cl.[4] B01D *57/02*; G01N *27/28*
U.S. Cl. 204—299 R **16 Claims**

1. A capillary tube comprising:
a wall surrounding an axis, said wall defining a first space inside the wall and a second space outside the wall, said wall suitable for containing and confining an electrolytic solution in the first space; and
a structure in the wall extending between the first and second spaces, said structure not completely surrounding the axis so that the wall retains its structural integrity and so that the tube is suitable for use in electrophoresis without requiring structural support, wherein said structure permits ions but substantially no electrolytic solution to flow therethrough, so that said structure permits electrical





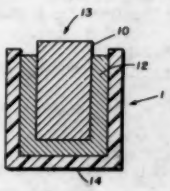
contact between the first and second spaces through ionic movement.

4,908,117

SOLID STATE REFERENCE ELECTRODE

Patrick J. Kinlen, High Ridge, and John E. Heider, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 929,879, Nov. 13, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 304,007
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—415 **16 Claims**

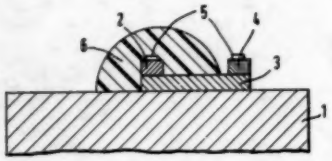


1. A metal/metal salt solid state reference electrode consisting essentially of
(a) a metal/metal salt electrode comprising
(1) a conductive layer of a metal, and
(2) a layer of a salt of said metal in conducting contact with said conductive layer of said metal,
(b) a coating of an immobilized electrolyte in contact with said metal salt layer, wherein said immobilized electrolyte coating contains the electrolyte of said metal salt, and
(c) a coating of a cured perfluorocarbon copolymer cation exchange polymer on said immobilized electrolyte coating, wherein said polymer is cured by heating to a temperature sufficient to change the molecular configuration of said polymer so as to provide a barrier to migration of said electrolyte away from said electrode.

4,908,118
SENSOR FOR MONITORING HYDROGEN CONCENTRATION IN GASES

Sonya Ammende, Frankfurt am Main; Hartmut Erdmann, Steinbach; Heinz-Werner Etzkorn, Neu Anspach, and Klaus Zucholl, Mannheim, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 23, 1987, Ser. No. 124,326
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639802
Int. Cl.[4] G01N 27/46
U.S. Cl. 204—424 8 Claims



1. A sensor for monitoring hydrogen concentrations in gases, comprising:

a solid electrolyte body comprising at least one of nasicon, titsicon, khibinskite, wadeite and β-Al_2O_3;

a detector electrode having a surface to be exposed to a gas to be monitored; and

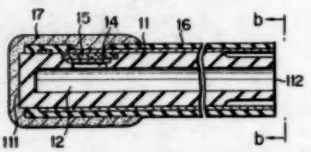
a reference electrode comprising sodium tungsten bronze;

wherein said reference electrode and said detector electrode both make contact with said solid electrolyte, said detector electrode comprises platinum, or palladium or palladium oxide, and said detector electrode generates an electromotive force when hydrogen reacts with said detector electrode.

4,908,119
APPARATUS FOR DETERMINING OXYGEN CONCENTRATION

Toshitaka Saito, Toyohashi; Hiromi Sano; Soji Ota, both of Nagoya, and Syohei Udo, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 1, 1987, Ser. No. 91,964
Claims priority, application Japan, Sep. 1, 1986, 61-205311; May 19, 1987, 61-122031
Int. Cl.[4] G01N 27/46
U.S. Cl. 204—426 10 Claims



1. A detecting apparatus for detecting the oxygen concentration in an exhaust gas, said apparatus comprising:

a cylindrical core made of an insulating material and having a hollow portion, said core having a closed distal end and an open proximal end, said proximal end being disposed to introduce a reference gas into the hollow portion, said core further having an opening formed transversely through said core and communicating with the hollow portion of said core;

a layer made of solid-state electrolyte mounted at least partially around said core so as to close the opening formed in said core, and having first and second electrode layers respectively formed on upper and lower surfaces of said electrolyte layer, said first electrode layer being exposed to a sample gas disposed around an outer surface of said core, and said second electrode layer being exposed to a reference gas introduced into the hollow portion of said core through said opening; and

an insulating member wound around the outer surface of said core and having a heater with two ends, a pair of conductive layers connected to the ends of the heater and other conductive layers contacting and electrically connected to said first and second electrode layers.

4,908,120
CATALYTIC DEWAXING PROCESS USING BINDER-FREE ZEOLITE

Emmerson Bowes, East Amwell, N.J., and Fritz A. Smith, New Hope, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,199
Int. Cl.[4] C10G 65/10
U.S. Cl. 208—59 19 Claims

1. A process for catalytically dewaxing a waxy hydrocarbon lubricant feed having an initial boiling point of at least 650° F. and a wax content of at least 25 weight percent, which comprises;

(i) catalytically dewaxing the feed by contacting the feed in the presence of hydrogen with a dewaxing catalyst consisting essentially of extruded particles of a zeolite having dewaxing capability at a substantially constant reactor inlet temperature during a dewaxing cycle to produce a partly dewaxed product wherein a substantially constant temperature is defined as a temperature increase of no more than 40° F.,

(ii) further dewaxing the partly dewaxed product by contacting it in the presence of hydrogen with a dewaxing catalyst consisting essentially of extruded particles of a zeolite having dewaxing capability at a temperature which is progressively increased during the dewaxing cycle to produce a dewaxed product having a target pour point wherein a progressively increased temperature is defined as a temperature increase greater than 40° F.

4,908,121
FLEXIBLE FEED PYROLYSIS PROCESS

Larry G. Hackemesser, and Bradley L. Lankford, both of Houston, Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed May 12, 1986, Ser. No. 861,963
Int. Cl.[4] C10G 9/20
U.S. Cl. 208—85 9 Claims

1. A process for steam cracking hydrocarbons in a tubular, fired furnace having a convection section for preheating the hydrocarbons and a radiant section for cracking the preheated hydrocarbons which comprises:

(a) preheating an initial hydrocarbon feed in the convection section;

(b) mixing diluent steam with the resulting preheated, initial hydrocarbon feed to form a mixed feed;

(c) cooling the mixed feed;

(d) reheating the cooled mixed feed in the convection section; and

(e) cracking the reheated mixed feed containing all the initial hydrocarbon feed in the radiant section.

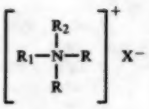
4,908,122

PROCESS FOR SWEETENING A SOUR HYDROCARBON FRACTION

Robert R. Frame, Glenview, and Jeffery C. Bricker, Buffalo Grove, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 8, 1989, Ser. No. 349,013
Int. Cl.[4] C10G 27/10, 29/00
U.S. Cl. 208—207 9 Claims

1. A process for sweetening a sour hydrocarbon fraction containing mercaptans comprising contacting the hydrocarbon fraction in the presence of an oxidizing agent with a catalytic composite effective in oxidizing said mercaptans to disulfides, ammonium hydroxide and a quaternary ammonium salt having the structural formula



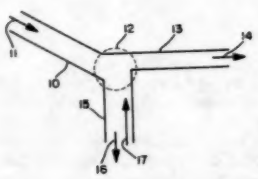
where R is a hydrocarbon group containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, R_1 is a straight chain alkyl group containing from about 5 to about 20 carbon atoms, R_2 is a hydrocarbon group selected from the group consisting of aryl, alkaryl and aralkyl, X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate and tartrate, and said catalytic composite comprising a metal chelate dispersed on an adsorbent support.

4,908,123

METHOD AND APPARATUS FOR REMOVING RELATIVELY DENSE FOREIGN MATERIALS FROM SHREDDED PAPER

Robert M. Miers, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 16, 1986, Ser. No. 852,671
Int. Cl.[4] B07B 4/00
U.S. Cl. 209—133 8 Claims



1. An air separator for removing relatively dense foreign materials from shredded paper comprising:

(a) a downwardly pitched open-ended inlet duct for receiving and conveying shredded paper;

(b) a substantially horizontal outlet duct for conveying an airborne stream of retained shredded paper; and

(c) a substantially vertical open-ended discharge duct for receiving the relatively dense foreign materials and deflecting them away from the shredded paper, said discharge duct having a cross-sectional area greater than the cross-sectional area of the inlet duct;

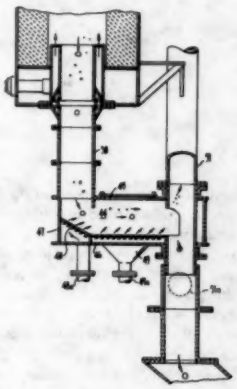
wherein each of the abovesaid ducts is joined to the other two ducts at a common juncture and wherein the inlet duct and discharge duct are situated such that the inlet duct substantially projects onto a wall of the discharge duct.

4,908,124

METHOD AND APPARATUS FOR REMOVING FOREIGN OBJECTS FROM FLUID BED SYSTEMS

Gary O. Goldbach, San Jose, and Michael A. O'Hagan, Cupertino, both of Calif., assignors to Combustion Power Company, Menlo Park, Calif.

Continuation of Ser. No. 149,939, Jan. 29, 1988, abandoned, which is a continuation of Ser. No. 534,974, Sep. 22, 1983, abandoned, which is a division of Ser. No. 419,873, Sep. 20, 1982, Pat. No. 4,421,038. This application Mar. 15, 1989, Ser. No. 324,990
Int. Cl.[4] B07B 4/00
U.S. Cl. 209—139.1 3 Claims



1. Apparatus for separating foreign objects from fluid bed particles of a fluid bed combustion chamber wherein foreign objects are moved to one side of the fluid bed comprising:

a substantially vertical column, through which fluid can flow,

means for withdrawing a quantity of mixed inert fluid bed particles and foreign objects from the fluid bed and filling said substantially vertical column with said mixed fluid bed particles and foreign objects,

said withdrawing means including a material flow control plenum chamber having a first end and a second end and

a substantially vertical passageway connected to said first end of said plenum chamber and connected to the one side of the fluid bed such that said passageway receives said withdrawn quantity of mixed particles and objects from said fluid bed and feeds them to said plenum chamber,

means for fluidizing the bottom portion of said passageway of mixed fluid bed particles and foreign objects with an air stream which air stream is directed laterally to said column,

said fluidizing means including means at a plurality of locations in the bottom of said plenum chamber for introducing fluidizing air with a directional component in a direction from said first end to said second end of said plenum chamber such that said mixed particles and foreign objects are directed into said vertical column,

means for subjecting the laterally directed stream of mixed fluid bed particles and foreign objects to a substantially upwardly vertically directed steeam of classifying air whereby the heavy foreign objects drop downwardly through said column for collection and the lighter fluid bed particles rise through said column and are elevated above said column, and

means for separating said fluid bed particles from said classifying air and returning said fluid bed particles to the fluid bed combustion chamber.

4,908,125

FROTH FLOTATION PROCESS FOR THE RECOVERY OF MINERALS AND A COLLECTOR COMPOSITION FOR USE THEREIN

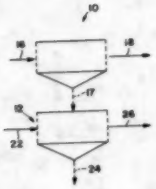
James M. W. Mackenzie, Sandton, and Peter J. Cabassi, Transvaal, both of South Africa, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 215,961

Claims priority, application South Africa, Jul. 7, 1987, 87/4930

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **16 Claims**



1. A froth flotation process for recovering a metal mineral from a metal mineral containing ore, which process includes mixing with a flotation feed comprising a ground pulp of the ore and water a collector for said metal mineral, said collector comprising a first reagent comprising at least one member selected from the group consisting of unsubstituted primary amines of formula $R—NH_2$ and unsubstituted secondary amines of formula $R_1R_2—NH$ where each of R, R_1 and R_2 is an aliphatic hydrocarbyl group having from 8 to 22 carbon atoms and the salts of said primary and secondary amines; and said collector further comprising a second reagent comprising at least one member selected from the group consisting of xanthates, dithiophosphates, mercaptobenzothiazoles, xanthogen formates and thionocarbamates to form a mixture; subjecting the mixture to flotation; and recovering the metal mineral in a flotation froth.

4,908,126

APPARATUS FOR TESTING AND SORTING ELECTRONIC COMPONENTS, IN PARTICULAR IC'S

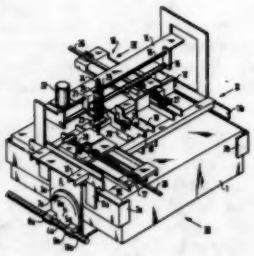
Hans-Heinrich Willberg, Altoging/Bad Feilnbach; Ekkehard Ueberreiter, Raubling, and Franz Schöttlfer, Grosskarolinenfeld, all of Fed. Rep. of Germany, assignors to Multitest, Elektronische Systeme GmbH, Rosenheim-Aisingerwies, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 118,957

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638430

Int. Cl.[4] B07C *5/344*

U.S. Cl. 209—573 **15 Claims**



1. Apparatus for testing and sorting electronic components, comprising:

an input magazine, with at least one magazine channel for the components to be tested,

a testing head for the components to be individually tested one after another and having a socket with connection contacts,

a test computer to supply test signals to the testing head for the components,

an output magazine having at least one magazine channel for the components found to be sound and at least one magazine channel for the components found to be faulty, and

a movable transfer element for transporting the components from the input magazine to the testing head and from the testing head to the output magazine, the moveable transfer element including,

(i) a carriage guide, and

(ii) a carriage mounted on the carriage guide for sliding movement therealong, first, to carry the electronic components to the testing head from the input magazine, and to connect the electronic components to the testing head to receive the test signals therefrom, and second, after each electronic component has received the test signals, to carry the electronic component to the output magazine from the testing head, and to deposit the electronic component in the output magazine.

4,908,127

DEVICE FOR THE COLLECTION OF VARIOUS SUBSTANCES PRESENT IN A LIQUID

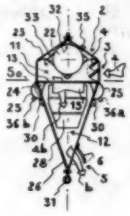
Jacques J. Metais, 72, rue du Cherche-Midi, 75006 Paris, France

Division of Ser. No. 691,571, May 4, 1983, abandoned. This application May 27, 1987, Ser. No. 81,853

Claims priority, application France, Nov. 6, 1981, 81 20853

Int. Cl.[4] C02F *1/40*

U.S. Cl. 210—123 **12 Claims**



1. A floating barrage for recovery of light substances floating on a body of water, a surface of said water being choppy or rough, comprising:

a. a flexible, elongated, inflatable floating structure;

b. a plurality of collecting compartments connected to said floating structure lengthwise, said compartments being constructed and arranged to be partially submerged in said body of water;

c. each said compartment comprising an upper chamber and a lower chamber;

d. said upper chamber comprising at least one inlet means, said inlet means being constructed and arranged to be positioned near said surface of said body of water, and said inlet means comprising inlet valve means for allowing water and floating light substances to flow into said upper chamber while preventing return flow from said upper chamber;

e. said upper chamber further comprising valve means communicating with said lower chamber for allowing said water and light substances to flow from a lower part of said upper chamber into said lower chamber while preventing return flow into said upper chamber;

f. said lower chamber comprising at least one outlet means,

said outlet means being constructed and arranged to be positioned below said surface of said body of water, and said outlet means comprising outlet valve means for allowing said water to flow from a lower part of said lower chamber into said body of water while preventing return flow into said lower chamber;

g. said lower chamber further comprising valve means communicating with all adjacent lower chambers for allowing flow of said waters and floating substances through said lower chambers, in a direction from a first end of said plurality of collecting compartments towards a second end of said plurality of collecting compartments, while preventing return flow in a direction from said second end towards said first end; and

h. wherein all said valve means are constructed and arranged to respond freely and automatically to vertical movements of said choppy or rough surface of said body of water to allow flow of said water and light substances to said upper chambers of each compartment, downwardly from said upper chamber to said lower chamber, outwardly from said lower chambers of each compartment, and longitudinally through said lower chambers of said plurality of compartments from said first end to said second end of said plurality of compartments.

4,908,128

COMPOSITE BACTERIA SUPPORT MEDIUM

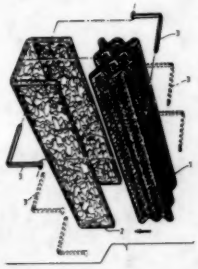
Akira Chiba, Frenchs Forest, Australia, assignor to Envirocycle Pty. Ltd., Forestville, Australia

Filed Sep. 12, 1988, Ser. No. 243,256

Claims priority, application Australia, Sep. 15, 1987, PI4422

Int. Cl.[4] B01D *33/34*

U.S. Cl. 210—150 **10 Claims**



1. A composite bacteria support medium comprising: two proximately arranged component bacteria support media of differing characteristics, a first bacteria support medium having a predetermined surface area to volume ratio and a second bacteria support medium having a substantially different surface area to volume ratio in intimate association with the first medium forming a means for encouraging the growth of substantial numbers of not only higher order but also lower order microorganisms within one said composite medium

4,908,129

IMPERVIOUS LAYER FORMATION PROCESS AND LANDFILL ADSORPTION SYSTEM

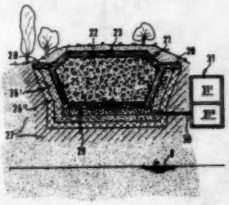
Klemens Finsterwalder, Ratingen-Hösel, and Jürgen Spirres, Ratingen, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,614

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717884; May 27, 1987, 3717885

Int. Cl.[4] B01D *23/10*; C02F *7/00*

U.S. Cl. 210—170 **17 Claims**



1. Arrangement for removing harmful substances from water seeping from a waste dumping ground body into a natural soil formation, comprising at least one impervious layer containing mineral sealing materials, wherein the improvement comprises an adsorption layer located adjacent to the impervious layer, said adsorption layer includes materials capable of binding the harmful substances in the water seeping from the waste dumping ground body by at least one of physical or chemical adsorption, the adsorption layer is located downstream of the impervious layer relative to the direction of flow of water through the impervious layer and between the natural soil foundation and the impervious layer so that water exiting from the adsorption layer flows into the natural soil formation free of any flow blockage, the adsorption layer includes mineral sealing materials mixed with adsorbing materials, said mineral sealing material comprises clay, and the adsorption layer is formed of at least two different adsorption layers, each of the different adsorption layers contains material with different adsorption characteristics.

4,908,130

AUTOMOBILE GASOLINE IMPURITIES REMOVAL APPARATUS

Mark Lynne, Valley Stream, N.Y., assignor to Empire Research and Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 864,491, May 19, 1986, abandoned. This application Oct. 6, 1987, Ser. No. 105,990

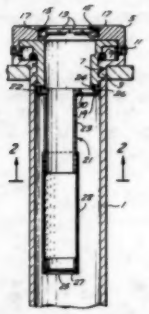
Int. Cl.[4] B01D *35/02*

U.S. Cl. 210—172 **13 Claims**

8. Automobile gasoline impurities removal apparatus comprising;

a cap member having an upper member and a lower member rotatably mounted under said upper member, said upper member having means defining a bore and said lower member having means defining an eccentrically disposed aperture in communication with said bore, and

filter means releasably mounted on said lower member and having means defining a bore in communication with said



aperture, said filter having an axis rotatable about the axis of the bore in said cap.

4,908,131

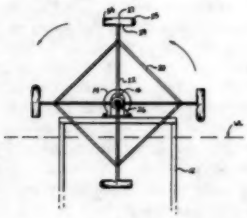
AERATION DEVICE

Thomas R. Moore, Rte. 7, Box 322, Dickson, Tenn. 37055

Filed Jan. 15, 1988, Ser. No. 144,057

Int. Cl.[4] B01F *3/04*; C02F *7/00*

U.S. Cl. 210—219 **10 Claims**



1. A new and improved aeration device, comprising:

support base means;

motor means on said support base;

hub means secured to a rotary output shaft of said motor means;

a plurality of radially extending rod means spaced around the periphery of said hub means;

cup means secured to a free end of each of said rod means; and

brace strut means extending between each pair of adjacent rod means.

4,908,132

SHOCK RESISTANT RECEIVER DEHYDRATOR

Richard Koval, North Rose, N.Y.; Robert C. Aman, Jr., Prior Lake, Minn., and Walter O. Krause, Newark, N.Y., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Jul. 26, 1989, Ser. No. 385,768

Int. Cl.[4] B01D *29/00*

U.S. Cl. 210—446 **12 Claims**

1. A shock and vibration resistant receiver dehydrator for an air conditioning system, comprising:

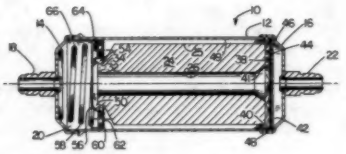
a fluid tight body having an interior area, said interior area including a cylindrical portion having an inner surface;

inlet means on said body for introducing refrigerant material into said interior area of said body;

outlet means on said body enabling flow of refrigerant material out of said interior area;

a desiccant core positioned in said cylindrical portion, said desiccant core including a central projection on a first end, said projection having a lateral perimeter surface, said desiccant core further including a blunt second end opposed of said first end, said second end including a perimeter edge, said edge in spaced relation of said inner surface;

a circular baffle plate adjacent said first end of said core, said baffle plate including a recess and a radially extending flange, said flange terminating adjacent said inner surface of said cylindrical portion, said baffle plate further including passage means for enabling the passage of refrigerant material therethrough;



a resilient core support positioned in said recess of said baffle plate between said plate and said core, said core support overlapping said lateral perimeter surface of said projection;

supporting means for supporting said core adjacent said second end;

a compressible, refrigerant pervious pad positioned between said second end of said core and said supporting means, said pad including an outer surface extending beyond and in overlapping relation of said perimeter edge; and

biasing means adjacent said first end of said core for biasing said baffle plate toward said core;

whereby said core is held in position and cushioned at said first and second ends.

4,908,133

PROCESS FOR WORKING UP AQUEOUS ELECTROLYTE-CONTAINING SUSPENSIONS OF HIGHLY SWELLABLE LAYER SILICATES

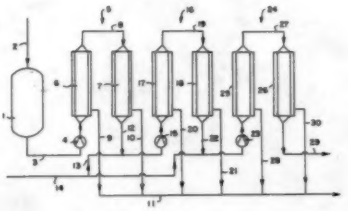
Willi Wuest, Ratingen, and Norbert Kuehne, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 343,467

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3815008

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—641 **11 Claims**



1. A continuous multistage membrane filtration process comprising working up an aqueous electrolyte-containing suspension of highly swellable layer silicates by (1) passing said suspension through a membrane filtration stage to from a retentate composed of said concentrate wherein said concentrate contains said highly swellable layer silicate and a portion of said electrolyte, the remaining portion of said electrolyte being present in said permeate; (2) diluting said concentrate

with completely deionized water to form a slurry, and (3) recycling said slurry to step (1) and (2) and continuing said recycling until an electrolyte-free layer silicate suspension is produced.

4,908,134

ULTRAFILTRATION POLYAMIDE MEMBRANE AND ITS USE FOR RECOVERY OF DEWAXING AID (OP-3454)

Bryce P. Anderson, Carlsbad, Calif., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 16, 1989, Ser. No. 312,020
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 8 Claims

1. A method for recovering dewaxing aids used in the solvent dewaxing of waxy hydrocarbon oils wherein the dewaxing aid is present in a dewaxed oil stream, a precipitated wax stream or both and wherein the dewaxing aid present in said dewaxed oil stream, precipitated wax stream or both is recovered by heating said stream so that the wax is in the liquid state and contacting said heated stream with an ultrafiltration polymeric membrane to selectively permeate through said membrane the oil or wax component of said heated stream while producing retentate containing the dewaxing aid which retentate can be recycled to the solvent dewaxing process wherein the ultrafiltering polymeric membrane comprises a polyimide membrane made by dissolving a fully imidized polyimide polymer in a pro solvent or mixture of pro solvents and a pore forming agent characterized by having at least about 50% more molar volume than the solvent or solvent mixture used, a solubility parameter equal to a greater than that of the solvent and a polar end and substantial hydrocarbon character, to produce a casting solution, using said casting solution to produce a thin layer of said polyimide polymer/solvent/pore former, and quenching the layers in a quenching solvent.

4,908,135

MOIETY FOR SELECTIVE SEPARATION

Brian J. Brisdon; Richard England, and Sera S. Abed-Ali, all of Bath, England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 147,992, Feb. 25, 1988. This application Jul. 13, 1989, Ser. No. 379,233
Claims priority, application United Kingdom, Feb. 5, 1987, 8702569
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—654 5 Claims

1. A carrier including one or more pendant alkylene-polyoxa-cycloalkane groups derived from a cycloalkane selected from the group consisting of 1,4,7,10-tetraoxa-2-alkenyl-cyclododecane, 1,4,7,10,13-pentaoxa-2-alkenyl-cyclopentadecane and 1,4,7,10,13,16-hexaoxa-2-alkenyl cyclooctadecane sufficient for enabling separation of secondary amines from tertiary amines.

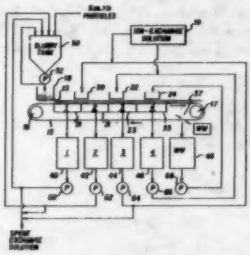
5. A method of separating secondary from tertiary amines, comprising contacting them with a carrier including one or more pendant alkylene-polyoxa-cycloalkane groups derived from a cycloalkane selected from the group consisting of 1,4,7,10-tetraoxa-2-alkenyl-cyclododecane, 1,4,7,10,13-pentaoxa-2-alkenyl-cyclopentadecane and 1,4,7,10,13,16-hexaoxa-2-alkenyl cyclooctadecane sufficient for enabling separation of secondary amines from tertiary amines.

4,908,136

METHOD AND APPARATUS FOR FORMING AND ION-EXCHANGING A FILTER CAKE

Tai-sheng Chou, Pennington, N.J., and Thomas R. Kiliany, Jr., West Chester, Pa., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 139,546, Dec. 30, 1987. This application Apr. 18, 1989, Ser. No. 339,571
Int. Cl.[4] B01D *33/32;* C02F *1/42*
U.S. Cl. 210—661 12 Claims



7. A process for producing a filter cake comprising:

moving a horizontal vacuum filter belt having at least one vacuum stage associated therewith;

depositing a slurry containing a mixture of solid particles onto said filter belt through a first weir box to produce a solid particle filter cake on said filter belt, said first weir box including a slurry outlet extending transversely of said filter belt through which said slurry passes as it is deposited on said filter belt, said slurry outlet includinng a plurality of cutouts spaced there along, each of which has the shape of a truncated triangle with the base of the triangle being closer to the filter belt than the truncated portion of the triangle; and

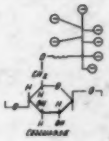
providing a sufficient amount of slurry to said first weir box so that slurry passes onto said filter belt by flowing through said cutouts.

4,908,137

HEAVY METAL REMOVAL PROCESS

Wei-Chih Chen, Meriden; Michael A. Michaud, Middletown, and Kenneth C. Hou, S. Glastonbury, all of Conn., assignors to Cuno, Incorporated, Meriden, Conn.

Filed Apr. 11, 1989, Ser. No. 336,164
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—679 9 Claims



1. A method of removing heavy metal ions from an aqueous solution contaminated therewith comprising contacting said aqueous solution with an ion-exchange media comprising a modified polysaccharide material and a modified silica material, said modified materials comprising a polysaccharide and a silica material covalently bonded to a synthetic polymer, said synthetic polymer comprising a copolymer produced from a polymerization of:

(a) a polymerizable compound having a chemical group

capable of covalently coupling, directly or indirectly, to said materials; and

(b) a polymerizable compound containing (i) an ionizable chemical group or (ii) a chemical group capable of transformation to an ionizable chemical group.

4,908,138

HYDROXYACETONITRILE DIPHOSPHONIC ACID, A PROCESS FOR ITS PRODUCTION, AND ITS USE

Helmut Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

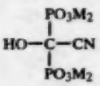
Filed Jul. 22, 1988, Ser. No. 223,210

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724654

Int. Cl.[4] C07C *120/00, 121/36, 121/34;* **C02F** *5/14*

U.S. Cl. 210—700 **23 Claims**

1. A compound which is hydroxyacetonitrile diphosphonic acid or a salt thereof of the formula



(III)

in which each M independently is H or an alkali metal cation or the ammonium cation $R^5R^6R^7R^8N^+$ in which R^5, R^6, R^7 and R^8 independently of one another are hydrogen or a branched or unbranched C_1–C_{12} alkyl radical.

20. A method of preventing or minimizing the precipitation of alkaline earth metal salts from aqueous solutions comprising adding thereto a complexing quantity of a compound of claim 1.

4,908,139

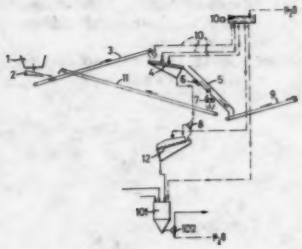
METHOD AND APPARATUS FOR SEPARATING AND RECOVERING PARTICULATE MATERIAL

Francois J. Callut, Ham-Sur-Heure, Belgium, assignor to Ryan Investments, B.V., United Kingdom

Division of Ser. No. 269,920, Nov. 10, 1988, Pat. No. 7,865,740. This application Jun. 29, 1989, Ser. No. 373,270

Int. Cl.[4] B01D *17/038*

U.S. Cl. 210—788 **12 Claims**



1. A method of separating and recovering particulate material which comprises providing a plurality of cyclone separators connected in series, the cyclone angle of the separators decreasing in the direction of flow and the cyclone angle α_2 of a cyclone separator in the series being ±5% of the angle calculated according to the formula

$$\frac{\cot(90-2\alpha_1)}{\cot(90-2\alpha_2)}=\frac{\phi_1}{\phi_2}$$

where α_2 is the cyclone angle of the cyclone separator following a separator with cyclone angle α_1, and ϕ_1 and ϕ_2 represent the geometric mean particle size of the cut of successive separators with these angles and feeding the material entrained in a liquid medium therethrough.

4,908,140

METHOD OF ENHANCING FABRIC REWETTABILITY WITH AN AQUEOUS EMULSION OF BRANCHED AND CROSS-LINKED POLYDIMETHYLSILOXANE

Gregory G. Bausch; Elizabeth A. Seelbach, and Alan Zombeck, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 236,864, Oct. 26, 1988, abandoned. This application Feb. 21, 1989, Ser. No. 312,158

Int. Cl.[4] D06M *00/00*

U.S. Cl. 252—8.6 **17 Claims**

1. The method of enhancing the rewettability of fabrics treated in a laundering operation comprising contacting the fabrics with a mixture including a rinse cycle fabric softening conditioning composition capable of producing a hydrophobic surface on the fabrics selected from the group consisting of quaternary ammonium salts and organic compounds having C_{12} to C_{18} hydrocarbon chain molecules of amines, esters, acids or amine oxides and an aqueous emulsion of a highly branched and crosslinked silicone polymer, the polymer being an organosiloxane of the formula:

$$R_nSiO_{\frac{4-n}{2}}$$

in which R is selected from the group consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals, and hydrogen atoms; and in which n is an interger having a value of one or two, the branched and crosslinked silicone polymer being a mixture including less than about forty percent of linear silicone polymer as determined by extraction with toluene.

4,908,141

C-BRANCHED ZWITTERIONIC SURFACTANTS AND ENHANCED OIL RECOVERY METHOD USING SAME

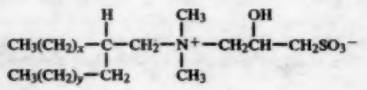
Roman Loza, Solon, and Roseann M. Cyngier, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 81,824, Aug. 5, 1987, Pat. No. 4,853,138. This application May 9, 1989, Ser. No. 354,154

Int. Cl.[4] E21B *43/22*

U.S. Cl. 252—8.554 **5 Claims**

1. A compound represented by formula



wherein x is in the range of about 3 to about 5 and y is in the range of about 10 to about 12, x is less than or equal to y+1, and the sum of x+y is in the range of about 7 to about 19, with the provisos that: (1) when the sum of x+y is in the range of about 7 to about 13, x/y is in the range of about 0.3 to about 1.2; and (2) when the sum of x+y is in the range of about 14 to about 19, x/y is in the range of about 0.1 to about 0.7.

4,908,142

EXTREME PRESSURE LUBRICATING COMPOSITIONS AND METHOD OF USING SAME

Josefina M. Dumdum, Chino Hills; Leah T. Mendelson, Santa Ana, and Richard L. Pilling, Fullerton, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 21, 1988, Ser. No. 260,912
Int. Cl.[4] C10M *135/14*
U.S. Cl. 252—17 84 Claims

1. A lubricating composition comprising a major amount of a lubricant and a minor amount of a salt or complex of trithiocarbonic acid.

4,908,143

LUBRICATING COMPOSITIONS AND METHOD OF USING SAME

Josefina M. Dumdum, Chino Hills; Leah T. Mendelson, Santa Ana, and Richard L. Pilling, Fullerton, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 4, 1988, Ser. No. 253,139
Int. Cl.[4] C10M *135/14*
U.S. Cl. 252—17 63 Claims

1. A lubricating composition comprising a major amount of a lubricant and a minor amount of a salt or complex of tetrathiocarbonic acid.

4,908,144

DIMERCAPTOTHIADIAZOLE-DERIVED, ORGANIC ESTERS, AMIDES AND AMINE SALTS AS MULTIFUNCTIONAL ANTIOXIDANT/ANTIWEAR ADDITIVES

Robert H. Davis, Pitman; Liehpao O. Farng, Lawrenceville, and Andrew G. Horodysky, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,065
Int. Cl.[4] C01M *135/36*
U.S. Cl. 252—47.5 36 Claims

1. A product of reaction having multifunctional antiwear-/antioxidant characteristics when admixed with various lubricating media prepared by reacting (1) a dimercaptothiadiazole with an epoxide to form dimercaptothiadiazole-derived alcohols which are thereafter (2) reacted with hydrocarbyl succinic anhydrides to form succinic acid esters which are thereafter (3) reacted with hydrocarbyl amines to produce the desired ammonium salt/amine/ester/acid derivative and wherein the reaction temperatures vary from about 50 to about 300° C., the pressure varies from ambient to slightly higher and the reaction time varies from about 0.5 to about 10 hours or more.

4,908,145

ENGINE SEAL COMPATIBLE DISPERSANTS FOR LUBRICATING OILS

David J. Fenoglio, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 30, 1987, Ser. No. 103,169
Int. Cl.[4] C10M *105/22*
U.S. Cl. 252—51.5 A 13 Claims

1. A process for preparing an oil soluble composition which is suitable for use as a lube oil dispersant additive having improved compatibility with fluorohydrocarbon-containing elastomeric engine seals, which process comprising reacting a hydrocarbyl substituted dicarboxylic compound selected from the group consisting of hydrocarbyl-substituted dicarboxylic acids, hydrocarbyl-substituted dicarboxylic acid anhydrides, and mixtures thereof, said hydrocarbyl substituent being about C_{30}–C_{200}, with a basic salt of aminoguanidine, wherein said reaction is conducted at a temperature of from about 170° C. (338° F.) to about 200° C. (392° F.) and the relative amounts of said aminoguanidine and said hydrocarbyl substituted dicarboxylic compound are such that the product obtained upon reaction thereof exhibits of dominant infrared peak at 1640 cm^{-1}.

6. A dispersant composition comprising: the reaction product obtained upon reacting a hydrocarbyl substituted dicarboxylic compound selected from the group consisting of hydrocarbyl substituted dicarboxylic acids, hydrocarbyl substituted dicarboxylic acid anhydrides, and mixtures thereof, said hydrocarbyl substituent being about C_{30}–C_{200}, with a basic salt of aminoguanidine at a temperature of from about 170° C. (338° F.) to about 200° C. (392° F.), said reaction product being characterized by a dominant infrared peak at 1640 cm^{-1}.

4,908,146

OIL ADDITIVE COMPOSITIONS EXHIBITING REDUCED HAZE CONTAINING POLYMERIC VISCOSITY INDEX IMPROVER

Marvin F. Smith, Jr., Aberdeen, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 16, 1988, Ser. No. 271,698
Int. Cl.[4] C10M *161/00*
U.S. Cl. 252—56 R 39 Claims

1. A process of reducing haze in a composition comprising
(i) lubricating oil;
(ii) at least a viscosity index improving amount of viscosity index improver comprising a hydrocarbon polymer; and
(iii) a haze forming amount of an oil insoluble haze forming material resulting from the manufacture or finishing processes of said hydrocarbon polymer;
which process comprises adding to said composition a haze-reducing effective amount of at least one hydrocarbyl substituted succinic acid.

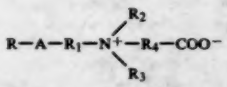
4,908,147

AQUEOUS SELF PRESERVING SOFT CONTACT LENS SOLUTION AND METHOD

Fupao Tsao, Lawrenceville, and Allen Penley, Atlanta, both of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 211,068, Jun. 20, 1988, abandoned, which is a continuation of Ser. No. 67,421, Jun. 24, 1987, abandoned, which is a continuation of Ser. No. 831,221, Feb. 19, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,957
Int. Cl.[4] C11D *1/92*
U.S. Cl. 252—106 9 Claims

1. An aqueous self-preserving soft contact lens cleaning or preserving solution comprising, as its only preservative agent, an effective surfactant and solution preserving amount of an amphoteric surfactant of the formula

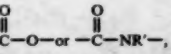


(I)

wherein

R is alkyl, alkenyl or alkanedienyl of six to eighteen carbon atoms which are unsubstituted or substituted by halo, amino or hydroxy;

A is —O—, —S—,



where R' is hydrogen or lower alkyl;

R_1 is alkylene of 2 to 6 carbon atoms, which is unsubstituted or substituted by hydroxy;

R_2 and R_3 are independently hydrogen or lower alkyl which is unsubstituted or substituted by one or two hydroxyls, one of which may be esterified with phosphoric or sulfuric acid; and

R_4 is alkylene of up to 3 carbon atoms, which is unsubstituted or substituted by hydroxy; and the ophthalmologically acceptable salts thereof; and water, said solution having a pH

such that upon removing a contact lens from said solution, said contact lens is capable of being placed directly on the eye without rinsing and without causing significant irritation to the eye on which said lens is placed.

4,908,148

RINSE ADDITIVE COMPOSITIONS PROVIDING GLASSWARE PROTECTION COMPRISING INSOLUBLE ZINC COMPOUNDS

Gregory S. Caravajal, and Gretchen R. Hatfield, both of Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 13, 1989, Ser. No. 310,813
Int. Cl.[4] C11D *3/12, 7/20*
U.S. Cl. 252—135 **15 Claims**

1. A liquid rinse additive composition, for use in an automatic dishwashing machine to inhibit glassware corrosion caused by washing with an automatic dishwashing detergent composition, comprising:

(a) from 0% to about 70% of a low-foaming polyoxyalkylene nonionic surfactant;

(b) an amount of an insoluble inorganic zinc compound, having an average particle size of less than about 250 microns, that will provide the composition with a level of zinc of from about 0.01% to about 10.0%; and

(c) from about 25% to about 90% of a solvent system.

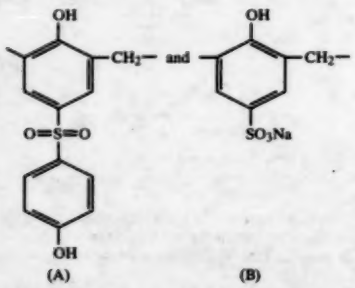
4,908,149

CLEANING COMPOSITION FOR TEXTILES CONTAINING SULFONATED COLORLESS DYE SITE BLOCKER

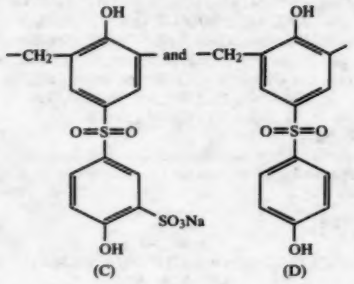
Patrick D. Moore, Spartanburg; Jack L. Rolen, Campobello, and Linda G. Coté , Greenville, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 10, 1988, Ser. No. 204,840
Int. Cl.[4] C11D *3/12, 3/37, 7/34*
U.S. Cl. 252—139 **15 Claims**

1. A cleaning composition for carpeting which comprises: (1.) a cleaning fluid selected from water containing sufficient surfactant to lower the surface tension to below 40 dynes per centimeter, an organic liquid selected from C_1 to C_4 aliphatic alcohols, high boiling hydrocarbon solvents and high boiling chlorinated hydrocarbon solvents, or mixtures of water, surfactant and said organic liquid; and (2.) a sulfonated, colorless dye site blocker provided in a sufficient amount to prevent or minimize deterioration of stain resistance properties in fifth generation nylon carpets; and wherein furthermore said dye site blocker is selected from aliphatic sulfonated polyesters; lignin sulfonates; sulfonated phenol-formaldehyde condensation products; condensation products prepared from mono-sulfonic acids having repeating units of the formula:



wherein the product ratio of (A) to (B) is 60 to 40 in the product having repeating units of the formulas:



where the ratio of units (C) to (D) is at least 8 to 1 sulfonated phenolformaldehyde condensation products in which from about 10 to 25 percent of the polymer units contain SO_3 radicals and about 90 to 75 percent of the polymer units contain sulfone radicals and in which a portion of the free hydrc..yl groups thereof have been acylated or etherified.

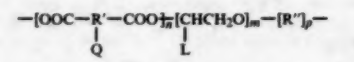
4,908,150

STABILIZED LIPOLYTIC ENZYME-CONTAINING LIQUID DETERGENT COMPOSITION

John F. Hessel, Metuchen; Martin S. Cardinali, Millington, both of N.J., and Michael P. Aronson, West Nyack, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 2, 1989, Ser. No. 305,878
Int. Cl.[4] C11D *3/37, 3/386*
U.S. Cl. 252—174.12 **11 Claims**

1. An isotropic enzymatic liquid detergent composition comprising, in an aqueous liquid medium, from 0.005–100LU per milligramme of the final composition of a lipolytic enzyme selected from *Humicola lanuginosa* and *Thermomyces lanuginosus* and bacterial lipases which show a positive immunological cross-reaction with the antibody of the lipase, produced by *Chromobacter viscosum* var. lipolyticum NRRL B-3673, from 5–35% by weight of a detergent-active compound, and from 0.1–10% by weight of an ethylene glycol containing polymer with an average molecular weight of 3,000 to 1,000,000 having the following structure



where R' is a saturated, unsaturated, or aromatic hydrocarbon of 2–18 carbon atoms, R'' is selected from the group consisting of propylene glycol, butylene glycol, fatty amine ethoxylate, polyethylene glycol ether of glycerol esters and fatty ethanolamides, Q and L are independently selected from the group consisting of:

(i) hydrogen, alkyl, alkylaryl, alkoxy, alkylamine groups containing 1 to 20 carbon atoms, and

(ii) a vinyl acetate graft; where

m has a value of at least one and n and p are any integer including zero, except n cannot be 0 when L is hydrogen, said polymer being soluble in said isotropic detergent composition.

4,908,151

OXYGEN ABSORBENT

Yoshiaki Inoue, and Toshio Komatsu, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Japan

Filed Feb. 12, 1988, Ser. No. 155,283
Claims priority, application Japan, Feb. 14, 1987, 62-30680; Sep. 9, 1987, 62-224082
Int. Cl.[4] A23L *3/34;* **B01J** *20/22;* **C09K** *15/32, 15/06*
U.S. Cl. 252—188.28 **15 Claims**

1. An oxygen absorbent comprising:

(A_1) an unsaturated fatty acid and/or a fatty oil containing unsaturated fatty acid,

(B_1) a transition metal and/or a transition metal compound, and

(C_1) a basic substance which is an alkaline earth metal compound of at least one of an an oxide, hydroxide, carbonate, bicarbonate, silicate, phosphate or organic acid.

4. An oxygen absorbent comprising:

(A_2) one member or a mixture of two or more members selected from unsaturated fatty acid compounds including unsaturated fatty acids, esters of unsaturated fatty acids and metallic salts of unsaturated fatty acids,

(B_2) a basic substance which is an alkaline earth metal compound of at least one of an oxide, hydroxide, carbonate, bicarbonate, silicate, phosphate or organic acid, and

(C_2) an adsorbent.

4,908,152

CYCLOHEXANE DERIVATIVE

Yasuyuki Goto, Chibaken, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Mar. 31, 1989, Ser. No. 331,379

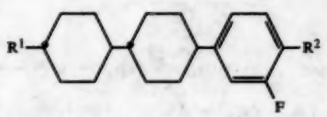
Claims priority, application Japan, Apr. 21, 1988, 63-99180

Int. Cl.[4] G02F *1/13*; C09K *19/30*; C07C *25/13*

U.S. Cl. 252—299.63 **8 Claims**

1. A liquid crystal compound having a low-temperature compatibility with other liquid crystal compounds, which compound is a 2-alkyl-5-[trans-4-(trans-4-alkylcyclohexyl) cyclohexyl]fluorobenzene expressed by the formula

(a)



wherein R^1 represents an alkyl group of 2 to 10 carbon atoms and R^2 represents an alkyl group of 2 to 10 carbon atoms.

4,908,153

TRANSPORT APPARATUS FOR ELECTROCOATING MACHINES

Hans Kossmann, Palatine, and Frank J. Herdzina, Schaumburg, both of Ill., assignors to Service Tool Die & Mfg. Company, Elk Grove Village, Ill.

Filed May 6, 1988, Ser. No. 190,879

Int. Cl.[4] C25D *13/12*; B65G *29/00*; B05C *13/02*

U.S. Cl. 204—300 EC **21 Claims**

1. Apparatus for electrocoating work pieces, comprising:

a frame;

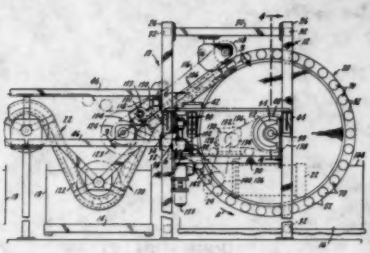
a tank connected to the frame and containing an electrocoating solution;

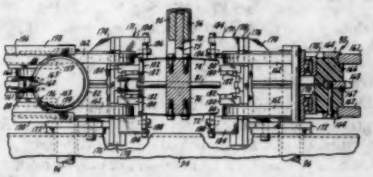
a wheel mounted for rotation on the frame and disposed partially within the electrocoating solution;

a plurality of work piece holders spaced around the wheel, each holder comprising a pair of spaced, flexible fingers each cantilevered from the wheel to define a free end on each finger for engaging a work piece;

cam means for displacing the free ends of the fingers from their normal, rest positions and then releasing the fingers;

transfer means for placing a work piece adjacent the displaced fingers at a pickup point such that upon release of





the fingers they engage the work piece in spring-loaded, gripping relation.

4,908,154

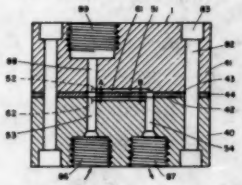
METHOD OF FORMING A MICROEMULSION

Edward J. Cook, South Hamilton, and Arthur P. Lagace, Newtonville, both of Mass., assignors to Biotechnology Development Corporation, Newton, Mass.

Continuation of Ser. No. 255,239, Apr. 17, 1981, abandoned. This application May 26, 1987, Ser. No. 58,697

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—314 **14 Claims**



1. A method of forming a microemulsion, said method comprising the steps of:

forming a mixture of liquids so as to produce a microemulsion-forming liquid system;

dividing said mixture into at least two mixture streams;

pressurizing each of said streams to a pressure of at least 4000 psi;

ejecting each of said pressurized streams through a corresponding nozzle, at a velocity of at least 40 meters/-second, into a low-pressure zone filled with said mixture so that said streams impinge upon one another in said low pressure zone so as to (a) create a turbulent jet interaction of said streams along a common boundary essentially defined and formed by said mixture in said low pressure zone and by said streams ejected into said zone, and (b) form said microemulsion so that said microemulsion includes disperse phase droplets having a diameter no greater than about 1 μm; and

removing said formed microemulsion from said low pressure zone.

4,908,155

POLYMERIC SURFACTANT

Luc E. Leemans, Diepenbeek; Herman J. Uytterhoeven, Bonheiden; Philippe J. Teyssié, Neuville en Condroz; Roger M. Fayt, Neupre, and Nikolaas C. de Jaeger, Hove, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

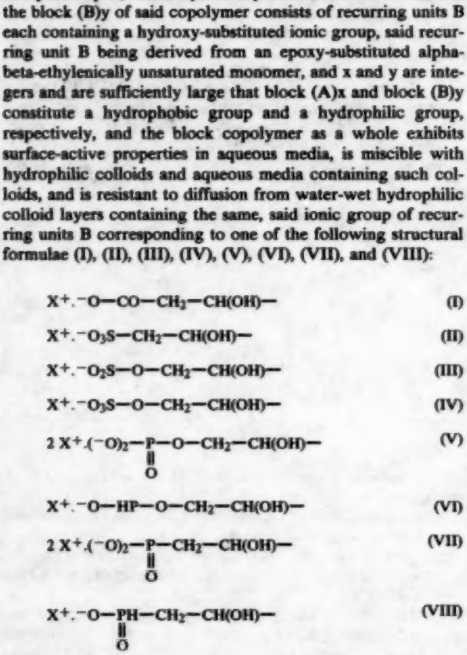
Filed Nov. 13, 1987, Ser. No. 120,151

Claims priority, application European Pat. Off., Nov. 21, 1986, 86202067.4

Int. Cl.[4] B01F *17/52*; G03C *1/84*; C08F *269/00*

U.S. Cl. 252—353 15 Claims

1. A block copolymer prepared by anionic polymerization comprising polymeric blocks (A)x and (B)y, wherein block (A)x is directly chemically linked at one end thereof to one end of block (B)y, the block (A)x of said copolymer consisting of recurring units A of at least one homo- or copolymerized non-polar alpha, beta-ethylenically unsaturated monomer and the block (B)y of said copolymer consists of recurring units B each containing a hydroxy-substituted ionic group, said recurring unit B being derived from an epoxy-substituted alpha-beta-ethylenically unsaturated monomer, and x and y are integers and are sufficiently large that block (A)x and block (B)y constitute a hydrophobic group and a hydrophilic group, respectively, and the block copolymer as a whole exhibits surface-active properties in aqueous media, is miscible with hydrophilic colloids and aqueous media containing such colloids, and is resistant to diffusion from water-wet hydrophilic colloid layers containing the same, said ionic group of recurring units B corresponding to one of the following structural formulae (I), (II), (III), (IV), (V), (VI), (VII), and (VIII):



$$X^+.^-O{-}CO{-}CH_2{-}CH(OH){-} \quad (I)$$

$$X^+.^-O_3S{-}CH_2{-}CH(OH){-} \quad (II)$$

$$X^+.^-O_2S{-}O{-}CH_2{-}CH(OH){-} \quad (III)$$

$$X^+.^-O_3S{-}O{-}CH_2{-}CH(OH){-} \quad (IV)$$

$$2\,X^+.(^-O)_2{-}\underset{\underset{O}{\|}}{P}{-}O{-}CH_2{-}CH(OH){-} \quad (V)$$

$$X^+.^-O{-}HP{-}O{-}CH_2{-}CH(OH){-} \quad (VI)$$

$$2\,X^+.(^-O)_2{-}\underset{\underset{O}{\|}}{P}{-}CH_2{-}CH(OH){-} \quad (VII)$$

$$X^+.^-O{-}\underset{\underset{O}{\|}}{PH}{-}CH_2{-}CH(OH){-} \quad (VIII)$$

wherein: X^+ is a cation.

6. A hydrophilic colloid layer comprising hydrophilic colloid and a block copolymer according to claim 1.

14. A hydrophilic colloid layer according to claim 6, wherein said layer is a light-sensitive silver halide emulsion layer, a subbing layer, an antistress layer, an antihalation layer or another photographic auxiliary layer.

4,908,156

SELF-REGULATING HEATING ELEMENT AND A PROCESS FOR THE PRODUCTION THEREOF

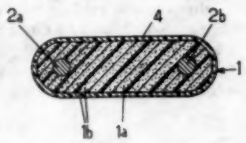
Bernard M. Dalle, Palaiseau; Claude Caillot, and Francois A. Legros, both of Paris, all of France, assignors to Electricite de France (Service National), Paris, France

Filed Aug. 20, 1987, Ser. No. 87,323

Claims priority, application France, Aug. 21, 1986, 86 11945

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 3 Claims



1. In a self-regulating heating element of the cable or band type of a crosslinked synthetic polymeric material based on ethylene and vinyl acetate to which a resistivity ρ, increasing with the temperature from a value ρamb at ambient temperature to a maximum value ρmax, is imparted by incorporating conductive charges consisting of carbon black, the improvement according to which the proportion of vinyl acetate is from 9 to 2% by weight, said carbon black which is present in a proportion from 13 to 30% by weight being selected from those of which

the specific surface is from 40 to 270,

the structure index is from 100 to 270,

the volatile content is less than 2%,

the mean particle size is from 10 to 40 nm.

4,908,157

ELECTRICALLY CONDUCTIVE POLYMER CONCRETE COATINGS

Jack J. Fontana, Shirley; David Elling, Centereach, and Walter Reams, Shirley, all of N.Y., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 26, 1988, Ser. No. 199,405

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 4 Claims

1. An electrically conductive polymer concrete coating suitable for spray applications comprising approximately 50–60% by weight of an electrically conductive filler selected from the group consisting of carbon black, coke breeze, and calcined coke breeze and 40–50% by weight of a resin selected from the group consisting of orthophthalic polyester resins, isophthalic polyester resins, and vinyl ester resins, to which has been added a thixotropic agent, which maintains said conductive filler in suspension.

4,908,158

ELECTRICAL CONTACT MATERIAL AND METHOD OF PREPARING SAME

Koji Tsuji, Nara; Shuji Yamada, Ashiya, and Yoshinobu Takegawa, Nara, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 88,225, Aug. 24, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 309,982

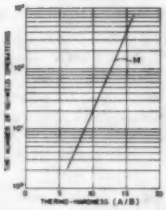
Claims priority, application Japan, Aug. 26, 1986, 61-199744

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—514 3 Claims

1. A contact material comprising: an Ag matrix and a metal-

lic oxide of Cd, Mn, and Al wherein said oxide is produced and dispersed in said Ag matrix by internal oxidation and wherein



said metallic oxide contains Cd of 1 to 20 wt %, Mn of 0.001 to 0.2 wt % and Al of 0.001 to 0.2 wt %.

4,908,159

DETERGENT GRANULES CONTAINING SIMPLE SUGARS AND A SEED CRYSTAL FOR CALCIUM CARBONATE

James F. Davies; Robert S. Lee; Andrew W. Travill, all of Merseyside, and Robert J. Williams, Oxford, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 862,073, May 12, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 224,229

Claims priority, application United Kingdom, May 10, 1985, 8511858

Int. Cl.[4] C11D *9/12*

U.S. Cl. 252—559 **2 Claims**

1. A detergent composition comprising:

(a) at least 5% by weight of the composition of silicate free detergent granules having an average size between 150 and 1800 microns and comprising:

(i) at least 15% by weight of a water-insoluble particulate carbonate material which is a seed crystal for calcium carbonate and which is selected from calcite, vaterite, aragonite and mixtures thereof;

(ii) at least 5% by weight of a non-soap detergent active material which is a dispersant for the water-insoluble particulate carbonate material and which is selected from non-soap anionic detergent active material, non-ionic detergent active materials and mixtures thereof;

(iii) at least 5% by weight of a sugar selected from sucrose, glucose, fructose, maltose, cellobiose, lactose and sorbitol, said percentages being based on the total weight of ingredients (i), (ii) and (iii),

(b) from 5% to 75% by weight of the composition of an alkali metal carbonate; and

(c) from 5% to 30% by weight of the composition of an alkali metal silicate.

4,908,160

FIRE RETARDANT COMPOSITION

Derek A. Thacker, Isle of Man, United Kingdom, assignor to Tag Investments, Inc., Vancouver, Canada

Filed Oct. 26, 1987, Ser. No. 112,459

Claims priority, application United Kingdom, Oct. 25, 1986, 8625572

Int. Cl.[4] C09K *21/00*

U.S. Cl. 252—608 **2 Claims**

1. A fire-retardant composition suitable for use in or in association with natural or synthetic materials comprising a mixture of:

(a) about one part by weight diammonium hydrogen phosphate;

(b) about 0.11 to about 0.19 parts by weight disodium hydrogen phosphate;

(c) about 1.6 to about 2.1 parts by weight ammonium dihydrogen phosphate.

4,908,161

FIRE RETARDANT FOR ISOCYANATE-BASED FOAMS COMPRISING AMMONIUM SULFATE AND A CYANURIC ACID DERIVATIVE

Kaneyoshi Ashida, Farmington Hills, Mich., assignor to Harry Fischer, Ontario, Canada

Filed Jun. 23, 1988, Ser. No. 210,748

Int. Cl.[4] C09K *21/10*; C08G *18/08*

U.S. Cl. 252—609 **5 Claims**

1. A flame retardant for a foam product prepared from an isocyanate and a polyhydric compound consisting essentially of an admixture of:

(a) ammonium sulfate powder present in an amount ranging from from about 50 parts to about 150 parts by weight per 100 parts by weight of the polyhydric compound and

(b) a cyanuric acid derivative selected from the group consisting of cyanamide, melamine, guanidine and biguanidine and mixtures thereof and present in an amount ranging from about 5 parts to about 100 parts by weight per 100 parts of ammonium sulfate.

4,908,162

METHOD OF MAKING TRIPLE BONDED UNSATURATED FATTY ACIDS

David Rubin, 8949 Montrose Way, San Diego, Calif. 92122

Continuation-in-part of Ser. No. 276,467, Nov. 22, 1988. This application Feb. 14, 1989, Ser. No. 310,205

Int. Cl.[4] C09F *5/00*

U.S. Cl. 260—405.5 **11 Claims**

1. A method for preparing an unsaturated fatty acid having triple bonds comprising;

reacting an unsaturated fatty acid having double bonds with a halogen to form a halogenated fatty acid;

mixing said halogenated fatty acid with a strong base and dicyclohexylcarbodiimide to form a salt of a triple bonded fatty acid; and

reacting said salt with an acid to form a triple bonded unsaturated fatty acid.

4,908,163

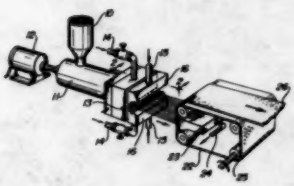
NONWOVEN MEDICAL FABRIC

Larry H. McAmish; Tralance O. Addy, both of Arlington, Tex., and George F. Lee, Greer, S.C., assignors to Surgikos, Inc., Arlington, Tex.

Division of Ser. No. 763,508, Aug. 8, 1985, Pat. No. 4,622,259. This application Jul. 11, 1986, Ser. No. 884,563

Int. Cl.[4] B29B *9/00*

U.S. Cl. 264—12 **11 Claims**



1. In a method of producing a nonreinforced meltblown microfiber embossed fabric wherein a fiber-forming thermoplastic polymer resin in molten form is forced through a row of orifices in a heated die into a primary stream of inert gas to attenuate the resin into fibers, and the fibers are collected on a receiver to form a web, and the web is thermally bonded to form a fabric, the improvement which comprises: maintaining the polymer melt temperature at a level which minimizes molecular degradation, controlling the velocity, volume and temperature of said primary stream of inert gas to produce fibers at least 80% of which have a diameter of 7 microns or less and having an average length of more than 10 centimeters,

introducing a highly uniform high velocity secondary stream of inert gas in quantities sufficient to cool the fibers and maintain good fiber separation, collecting the fibers at a forming distance which results in a web with low interfiber bonding, prior to embossing the web to form a fabric.

4,908,164

PROCEDURE FOR THE PRODUCTION OF MAGNETIC PLASTIC LAMINATE

Giovanni Brussino, Ceresole D'Alba, Italy, assignor to S.I.P.-A.P. Sas Di Demichelis Margherita & C., Ceresole D'Alba, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,226

Claims priority, application Italy, Mar. 31, 1987, 67252 A/87

Int. Cl.[4] B29C *43/20, 41/12, 41/22*

U.S. Cl. 264—22 **11 Claims**

1. A process for producing a magnetic plastic laminate, said process comprising the steps of:

impregnating at least three sheets of paper fiber with phenolic and melaminic resins and oven drying the impregnated paper fiber sheets;

applying a paste on at least one of said dried impregnated paper fiber sheets, said paste comprising a ferrous powder in an amount of 55% to 80% and a binder in an amount of 45% to 20%, said binder being a resin;

drying said paper fiber sheet having paste thereon, the thickness of the paste after drying being between 0.5 and 2.0 mm and the percentage of ferrous powder in the paste after drying being between 75% and 85%;

inserting said paper fiber sheet having paste thereon between the other two dried impregnated paper fiber sheets and hot pressing the resultant layered structure to produce a laminate; and then

applying an electrical charge to said laminate to permanently magnetize the laminate thereby producing a magnetic plastic laminate.

4,908,165

APPARATUS FOR COOLING A MELT STRIP OF THERMOPLASTIC SYNTHETIC RESIN AND PROCESS

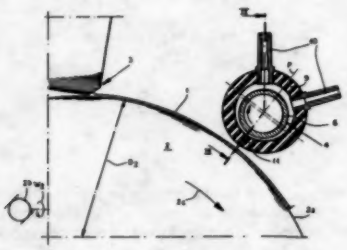
Walter Krämer, Bonn; Klemens Krumm, Neunkirchen-Seelscheid, and Hans D. Ott, St. Augustin, all of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co., Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,990

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735001

Int. Cl.[4] B29C *71/04*

U.S. Cl. 264—22 **19 Claims**



1. An apparatus for the cooling of a melt strip, comprising:

a cooling roller having a surface receiving a melt strip of thermoplastic synthetic resin to be cooled and rotatable about an axis;

means forming a nonrotatable ionization chamber composed of electrically insulating material and enclosing an axis, said chamber having an air outlet slit extending parallel to said axes and opening toward said surface, and at least one air inlet communication with said chamber;

an elongated metallic corona-discharge electrode in the form of a rigid bar extending parallel to said axes in said chamber, said bar being rotatable about said axis enclosed by said chamber and forming an axis of said bar,

means for applying an electrical potential across said electrode and said roller whereby said roller forms a counterelectrode for electrostatically adhering said strip to said surface by an electrostatic field generated between said electrode and said counterelectrode;

means for supporting said bar at opposite sides of said roller; and

means for rotating said bar about said axis enclosed by said chamber during generation of said electrostatic field.

19. A method of electrostatically adhering a melt strip of thermoplastic synthetic resin to a surface of a cooling roller rotated at a given angular velocity, comprising the steps of:

(a) feeding a melt strip of thermoplastic synthetic resin to a surface of a cooling roller rotated at a given angular velocity;

(b) juxtaposing with said strip and said surface an elongated metallic corona-discharge electrode in the form of a rigid bar extending parallel to an axis of rotation of said roller, spacedly juxtaposed with said surface and supported on opposite sides of said roller;

(c) applying an electric potential across said bar and said roller to constitute said roller as a counterelectrode and generate an electrostatic field adhering said strip to said surface; and

(d) rotating said bar about an axis thereof with a first angular velocity which is a multiple of a second angular velocity of said roller and such that a product of a diameter of said bar and said first angular velocity is greater than a product of a diameter of said roller and said second angular velocity.

4,908,166

METHOD FOR PREPARING POLYOLEFIN COMPOSITES CONTAINING A PHASE CHANGE MATERIAL

Ival O. Salyer, Dayton, Ohio, assignor to University of Dayton, Dayton, Ohio

Continuation-in-part of Ser. No. 96,288, Sep. 11, 1987, which is a continuation-in-part of Ser. No. 937,866, Dec. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 801,127, Nov. 22, 1985, Pat. No. 4,711,813. This application May 27, 1988, Ser. No. 199,972

Int. Cl.[4] B29C *35/02, 37/00*; C08J *3/28*

U.S. Cl. 264—22 **14 Claims**

1. Method of making a polyolefin composite article of the type having a phase change material selected from the group consisting of crystalline alkyl hydrocarbons, crystalline fatty acids and crystalline fatty acid esters; said phase change material having a heat of fusion greater than about 30 cal/g., dispersed therein comprising forming a melt of said polyolefin and mixing said phase change material throughout said melt, imparting the desired shape to said melt to form an article, and allowing said article to cool.

4,908,167

METHOD FOR PRODUCING FORM BODIES, SUCH AS BRIQUETTES

Franz Beckmann, Wuerselen, Fed. Rep. of Germany, and Armand Wagner, Esch-sur-Alzette, Luxembourg, assignors to Laborlux S. A., Esch-sur Alzette, Luxembourg

Filed Mar. 14, 1989, Ser. No. 323,440

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809616

Int. Cl.[4] C01B *31/02*; C10L *5/14, 5/16*

U.S. Cl. 264—29.3 6 Claims

1. A method for producing form bodies containing carbon, comprising the following steps:

(a) preparing a two component mixture by mixing 50 to 85% by weight of the mixture of a first component and 50 to 15% by weight of the mixture of a second binder component with each other, said first component including at least one fine grained solid material having a softening temperature above 800° C. as a first temperature, said second binder component including at least one pyrolytically decomposable binding agent having a second temperature such that said first temperature is above a uniform mixing and deformation temperature while said second temperature is below said uniform mixing and defomation temperature,

(b) sufficiently heating the mixture to said uniform mixing and deformation temperature to perform a pyrolysis and degassing of said second binder component without destroying a binding ability of said binding agent of said second binder component,

(c) selecting said second binder component as an at least partially liquified bituminous material having a mean CCT-value above 20%,

(d) keeping said mixture continuously in motion during said heating for about 2 to 20 minutes for said pyrolysis and degassing and removing any produced gases from the bituminous material, and

(e) immediately forming said form bodies at a pressing temperature within a range of 460° C. to 590° C., as soon as a solidification and coking has started in the pyrolytically decomposed bituminous material.

4,908,168

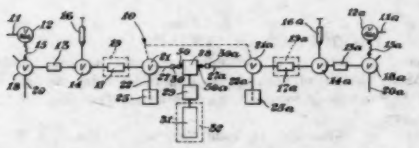
METHOD FOR SMALL SCALE FORMING OF HARDENABLE MATERIALS OF ORGANIC ORIGIN

Theodore E. Miller, Jr.; Tonja R. Sutton, both of Midland, Mich., and Charles J. Latta, Hanover Park, Ill., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 67,837, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 473,904, Mar. 10, 1983, abandoned. This application Feb. 25, 1988, Ser. No. 160,444

Int. Cl.[4] B29C *45/13*

U.S. Cl. 264—40.1 14 Claims



1. A method for mixing of at least two different synthetic resinous materials, which comprises the following steps:

(a) providing a predetermined volume of gas in a first gas reservoir and in a second gas reservoir at predetermined pressures of between about 30 atm. and 100 atm.,

(b) providing a predetermined quantity of up to about 100 cm^3, or gm, of a first material in a first material reservoir and a second material in a second material reservoir, said first and second material reservoirs each having a material storage inlet and a material storage outlet; said first and second storage inlets being in communication with first and second discharge means, said first and second discharge means each comprising a respective first and second discharge line and a respective first and second pressure transducer, the discharge lines each having a sufficiently narrow inner diameter such that each quantity of the first and second materials, when propelled by the gas under pressure, moves in a plug flow;

(c) introducing into each of the first and second material reservoirs the predetermined volume of the gas at the predetermined gas pressures which are sufficient to propel the quantities of the first and second materials in plug flow and to achieve turbulent flow prior to a shaping means;

(d) propelling the plugs of the first and second turbulent flowing materials through the discharge lines at a generally directly opposite angle to cause an overlapping contact between the materials in a mixing head;

(e) measuring the time and duration of the propelled plugs of the first and second turbulent flowing materials in the discharge lines by using the first and second pressure transducers, respectively;

(f) adjusting the gas pressure in the first and second gas reservoirs such that the materials are capable of being propelled at a velocity effective to cause overlapping contact between the materials; and

(g) repeating steps (a)–(d) after adjusting the gas pressure.

4,908,169

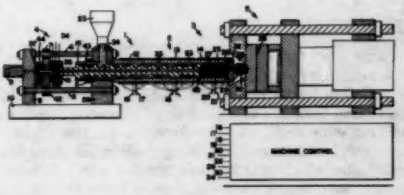
METHOD FOR PLASTICATING USING RECIPROCATING-SCREW HAVING A MELT CHANNEL AND SOLIDS CHANNEL

George J. Galic, 5140 St. Moritz Dr. NE., Columbia Heights, Minn. 55421, and Steven M. Maus, 16220 Territorial Rd., Osseo, Minn. 55369

Continuation-in-part of Ser. No. 929,399, Nov. 12, 1986, abandoned. This application Jun. 2, 1988, Ser. No. 201,771

Int. Cl.[4] B29C *45/50*

U.S. Cl. 264—40.2 20 Claims



1. A method for plasticizing thermoplastic polymer using a reciprocating-screw injection molding machine having a barrel with a screw operatively mounted therein, the screw having a root, shank and tip and forming a solids channel and a melt channel, the method comprising:

(a) feeding the polymer in its solid form into the barrel proximate the screw shank thereby establishing a solids bed;

(b) rotating the screw within the barrel thereby causing a melt barrier flight to engage the solids bed and effecting relative motion between the barrel and the solids bed;

(c) externally heating the barrel thereby producing a barrel wall melt film on an outer surface of the solids bed proximate the barrel wall;

(d) internally heating the screw to at least the melting temperature of said thermoplastic polymer thereby producing a screw surface melt film on an inner surface of the solids bed proximate the root of the screw;

(e) transferring the barrel wall and screw surface melt films from the solids channel to the melt channel, by providing means of maintaining fluid communication therebetween,

thereby substantially eliminating melt in the solids channel and accumulating melt mostly in the melt channel;

(f) maintaining the solids bed under substantially continuous compression forces between the barrel wall and the solids channel's screw surfaces, thereby maximizing the relative motion of a steadily diminishing solids bed to the barrel wall and minimizing the relative motion of said solids bed and said screw surface of the solids channel;

(g) reducing continuously the solids bed channel depth at a rate equal to the rate at which the solids bed's occupied volume is reduced by melt formation and transfer, to produce said substantially continuous compressive forces; and

(h) maintaining said continuously reduced solids bed to be in close thermal contact with the heated barrel and the heated screw surfaces throughout the plasticizing process, with said plastication melting process thus minimizing breakup of the solids bed before melting is substantially complete, whereby the polymer proximate the screw tip is substantially devoid of objectionable solids.

4,908,170

METHOD OF PRODUCING AN ANNULAR FOAM PRODUCT

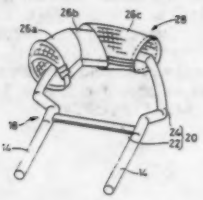
Kazunori Kurimoto, Konan, Japan, assignor to Tokai Chemical Industries, Ltd., Japan

Filed May 20, 1988, Ser. No. 196,550

Claims priority, application Japan, May 23, 1987, 62-126177

Int. Cl.[4] B29C *67/22*

U.S. Cl. 264—46.5 **6 Claims**



1. A method of producing an annular foam product having a core structure and a tubular skin, said core structure including a connecting portion and a generally U-shaped portion which cooperate with each other to form an annular frame, said tubular skin being formed by joining sheet members to form an annular tube which encloses said annular frame of said core structure, such that a cavity is formed between said tubular skin and said annular frame, said method comprising the steps of:

placing a plurality of skin members so as to surround respective parts of said U-shaped portion of said annular frame of said core structure, such that a nominal inside of each said skin member is exposed;

joining together opposite edges of each of said plurality of skin members, so as to form tubular skin members, such that the joined edges of each said skin member are located outside of said tubular skin members;

joining together the tubular skin members end to end to form a U-shaped skin tube, by (a) turning over one of the adjacent tubular skin members to expose a nominal outside thereof, (b) superposing the other of said adjacent tubular skin members on said one tubular skin member such that nominal outer surfaces of said adjacent tubular skin members face each other, (c) joining one end of said one tubular skin member to a corresponding one end of said other tubular skin member, and (d) turning over said other tubular skin member to expose a nominal outside thereof, said U-shaped skin tube surrounding said U-shaped portion of said annular frame;

joining each of opposite ends of a skin sheet to a corresponding one of opposite ends of said U-shaped skin tube while end portions of said skin sheet including said opposite ends thereof are turned inside out;

turning over said end portions of said skin sheet such that a nominal inside thereof is on the side of said connecting portion of said annular frame, and arranging said skin sheet to surround said connecting portion;

joining together opposite edges of said skin sheet along said connecting portion, thereby forming a connecting skin tube which surrounds said connecting portion of said annular frame, said U-shaped skin tube and said connecting skin tube cooperating with each other to constitute said tubular skin in the form of said annular tube which encloses said annular frame of said core structure to form a cavity; and

injecting a foamable material into said cavity formed between said tubular skin and said annular frame, and filling said cavity with a foam filler formed by the injected foamable material.

4,908,171

METHOD OF SINTERING ARTICLES OF SILICON NITRIDE

Nils Claussen, Leonberg; Jürgen Jahn, Stetten, and Günter Petzow, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foedering der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Continuation of Ser. No. 857,521, Apr. 23, 1986, abandoned, which is a continuation of Ser. No. 710,941, Mar. 13, 1985, abandoned, which is a continuation of Ser. No. 452,279, Dec. 22, 1982, abandoned, which is a continuation of Ser. No. 200,845, Oct. 27, 1980, abandoned, which is a continuation of Ser. No. 613, Jan. 2, 1979, abandoned. This application Jan. 27, 1988, Ser. No. 150,007

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1978, 2800174

Int. Cl.[4] C04B *35/58*

U.S. Cl. 264—56 **9 Claims**

1. In a method of pressureless sintering of silicon nitride (Si_3N_4) wherein a formed powder compact is heated under an inert atmosphere without hot pressing to form a sintered article, the improvement comprising:

grinding silicon nitride in an attritor mill using grinding bodies 1 to 3 mm in size of a material selected from the group consisting of a zirconium oxide material or silicate of aluminum, zirconium, beryllium, yttrium, and a combination thereof, to form a powder having an average particle size of 0.2 to 0.5 micrometers and a surface area of 10.5 to 35 square meters per gram;

forming the powder compact using the ground powder; and

heating the powder compact to a temperature in the range of 1700° C. to 1900° C. to sinter the compact into the sintered article.

4,908,172

PRODUCTION OF CERAMIC MOLDINGS

Hans-Josef Sterzel, Dannstadt-Schauernheim, and Gunther Mair, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,176

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725138

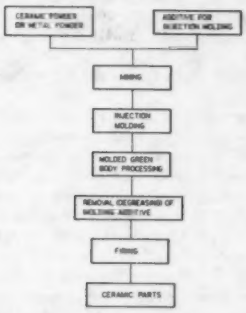
Int. Cl.[4] C04B *38/06*

U.S. Cl. 264—63 **5 Claims**

1. A process for the production of a ceramic molding, the process comprising:

(a) injecting a mixture containing a ceramic powder and a molding additive into a porous gas permeable mold that has an open-pore mold wall, wherein the molding additive is a solution of a high molecular weight polymer in a solvent, the ceramic powder is mixed at about 50–80% by

volume with 50–20% by volume of the solution, the mixture is injected at a temperature below the boiling point of the solvent under a pressure of 100 to 1,500 bar, and the gas permeable mold is at a temperature above the boiling



point of the solvent, so that some of the solvent is volatilized; and

(b) sintering the remaining mixture, wherein the injection pressure is maintained until gas no longer escapes from the mixture or the mold.

4,908,173

PROCESS FOR PREPARATION OF DENSE MOLDED BODIES OF POLYCRYSTALLINE ALUMINUM NITRIDE WITHOUT USE OF SINTERING AIDS

Karl-Alexander Schwetz, Bergstrasse 4, D-8961 Sulzberg; Wolfgang Grellner, Neisserstrasse 23, D-8960 Kempten; Klaus Hunold, Hochgratweg 8, D-8961 Lauben; Max Mohr, Gerberstrasse 33, D-8960 Kempten, and Alfred Lipp, Burgermeister-Singer-Strasse 15, D-8939 Bad Worishofen, all of Fed. Rep. of Germany

Division of Ser. No. 17,776, Feb. 20, 1987, Pat. No. 4,803,183. This application Aug. 29, 1988, Ser. No. 237,994

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608326

Int. Cl.[4] C04B *35/58*

U.S. Cl. 264—63 **2 Claims**

1. A process for producing an aluminum nitride molded body wherein the aluminum nitride is present in the form of an essentially single-phase, homogeneous, isotropic microstructure with a grain size of 5 μm maximum, the residual oxygen and the residual carbon being present in the form of a solid solution in the AlN lattice and not detectable as separate phase(s) up to a 2400-times enlargement, having the following properties: bending strength (measured according to the 4-point method) at room temperature and up to about 1400° C. of at least 500 N/mm^2, predominantly transcrystalline rupture mode and a heat conductivity at 300 K of at least 150 W/mK. which comprises:

forming a powder mixture of aluminum nitride and a carbon-containing material in the form of finely divided carbon per se or an organic material carbonizable at temperatures of up to 1,000° C. with formation of carbon;

compacting the powder mixture of aluminum nitride and the carbon containing material to form a green body;

heating the green body to a temperature of from 1600° to 1800° C. in a nitrogen atmosphere to form a porous deoxidized green body having a maximum density of 70% TD and a chemical composition of at least 99% by weight aluminum nitride, up to 0.35% by weight residual oxygen, up to 0.35% by weight residual carbon, and up to 0.30% by weight total of metallic impurities (Fe, Si, Ca, Mg);

encasing said porous, deoxidized green body, under vacuum, in a gas-tight casing; isostatically hot pressing the encased green body at a temperature of from about 1700° to 2100° C. while slowly raising the pressure to 100 to 400 MPa by an inert gas used as a pressure transmitting agent to form a molded body having a density of at least 98.8% TD and the same chemical composition as the deoxidized green body; removing the molded body from the high pressure autoclave after cooling; and stripping the casing from the molded body.

4,908,174

MOLDING OF CERAMIC MATERIALS

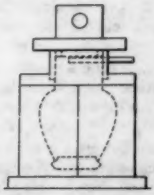
Guenther Will, Zimmerstrasse 11, 6100 Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 78,533, Jul. 28, 1987, Pat. No. 4,801,624, which is a division of Ser. No. 54,082, May 28, 1987, Pat. No. 4,727,092, which is a continuation of Ser. No. 764,851, Aug. 12, 1985, abandoned. This application Jan. 25, 1989, Ser. No. 301,640

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345188; Mar. 14, 1984, 3409278

Int. Cl.[4] B28B *1/26*; B29C *33/38*

U.S. Cl. 264—87 **4 Claims**



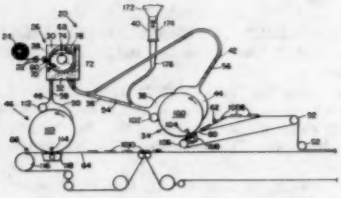
1. A method for shaping a ceramic article by any of various ceramic shaping procedures which comprises the steps of (1) preparing a mold comprising a shaped porous, open-pore, hardened, plastic composition, said mold having been prepared from said composition by forming said composition from a water-in-oil emulsion comprising an aqueous phase dispersed in a continuous oil phase comprising (a) at least one unsaturated polyester resin dissolved in at least one hardenable compound containing at least one ethylenically unsaturated group and ((b) at least one emulsifying agent; incorporating in said water-in-oil emulsion about 2–12% by weight of said hardenable compound of a material effective in accelerating the formation of said ceramic article to be shaped in said mold, said material being selected from the group consisting of sodium disilicate a tetraborate; controlling the ratio of said aqueous phase to said oil phase of said emulsion so that said porous, open-pore, hardened, plastic composition has an open-pore volume, which is refillable with water, of about 10–60% of the total volume of said porous, open-pore, hardened, plastic composition; placing said water-in-oil emulsion into the desired mold shape; subjecting said hardenable compound of said continuous oil phase to hardening without breaking said water-in-oil emulsion of said composition, and then drying said shaped w to thereby obtain said mold of said shaped, porous, open-pore, hardened, plastic composition; (2) withdrawing water from said ceramic slip or ceramic plastic mass through said open pores of said mold to shape said ceramic article; (4) removing residual ceramic slip or ceramic plastic mass from said mold; (5) drying said resultant shaped ceramic article while in said mold; and (6) separating said dried ceramic article from said mold.

4,908,175

APPARATUS FOR AND METHODS OF FORMING AIRLAID FIBROUS WEBS HAVING A MULTIPLICITY OF COMPONENTS

John J. Angstadt, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 868,219, May 28, 1986, Pat. No. 4,764,325. This application Aug. 9, 1988, Ser. No. 230,216
Int. Cl.[4] D04H *1/16*
U.S. Cl. 264—113 **17 Claims**



1. An apparatus for forming airlaid fibrous webs having a multiplicity of components each formed from a portion of a column of fibers, said apparatus comprising:

splitting means for splitting a column of fibers into a multiplicity of fiber streams and for entraining each of the fiber streams in air so as to provide a multiplicity of streams of air-entrained fibers;

first airlaying means having a first foraminous forming element for forming a first web component;

first deposition means for directing a first stream of air-entrained fibers formed from a portion of the column of fibers from said splitting means to said first foraminous forming element of said first airlaying means and for depositing the fibers on said first foraminous forming element;

second airlaying means having a second foraminous forming element for forming a second web component;

second deposition means for directing a second stream of air-entrained fibers formed from a portion of the column of fibers from said splitting means to said second foraminous forming element of said second airlaying means and for depositing the fibers on said second foraminous forming element; and

uniting means for uniting said first web component and said second web component so as to form an airlaid fibrous web.

12. A method for forming airlaid fibrous webs having a multiplicity of components each formed from a portion of a column of fibers, said method comprising the steps of:

providing a column of fibers;

splitting said column of fibers into a multiplicity of streams of air-entrained fibers;

directing a first stream of air-entrained fibers to a first airlaying means;

depositing said first stream of air-entrained fibers on the first airlaying means to form a first web component;

directing a second stream of air-entrained fibers to a second airlaying means;

depositing said second stream of air-entrained fibers on the second airlaying means to form a second web component; and

uniting said first web component and said second web component so as to form an airlaid fibrous web.

4,908,176

PROCESS FOR PRODUCING MOLDABLE NON-WOVEN FABRICS

Naoyuki Kato, Mie, Japan, assignor to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Continuation of Ser. No. 841,819, Mar. 20, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 124,388
Int. Cl.[4] D04H *1/00*
U.S. Cl. 264—127 **10 Claims**

1. A process for producing a moldable non-woven fabric, which comprises:

coating or impregnating a mat formed from a fiber mixture of from 15–50 wt. % of thermoplastic resin fibers and from 85–50 wt. % of synthetic or natural fibers having a melting point of more than 40° C. higher than the thermoplastic resin of the thermoplastic fibers with an aqueous emulsion of a thermoplastic resin which is moldable over a temperature of 80°–180° C. in an amount such that the resin solids content in the emulsion ranges from 15 to 300 wt. % based on the weight of the non-woven fabric mat;

heating the emulsion coated or impregnated mat to a temperature greater than the melting point of the resin of the emulsion in order to remove water therefrom; and then

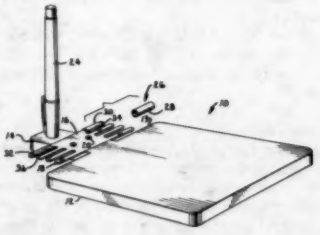
compressing the dried mat at a temperature above the melting point of the resin of the emulsion, thereby obtaining a molded product, thereby obtaining a mat whose density is controlled to within the range of 0.15 to 5 g/cm^3.

4,908,177

FIELD MARKING OF ELECTRICAL WIRING

Ralph D. Hartner, 5719 Sloan, Kansas City, Kans.

Filed Nov. 22, 1988, Ser. No. 274,510
Int. Cl.[4] C04B *41/00*; B29C *41/00, 61/00*
U.S. Cl. 264—132 **3 Claims**



1. A method of marking electrical wires and the like, said method comprising:

providing a preparation board having a neck portion extending therefrom;

providing a plurality of spaced, essentially flat tabs extending outwardly from said neck portion;

deformably elastically flattening and positioning flexible, tubular heat recoverable sleeves on said tabs which are of widths greater than the internal diameter of said corresponding sleeves to present an essentially flat writing surface on each of said sleeves;

placing indicia on said flat writing surface to provide marked sleeves;

removing said marked sleeves from said, tabs whereby, said sleeves elastically recover their original heat recoverable tubular shape and diameter;

placing said marked sleeves coaxially about said wires having diameters less than that of said sleeves; and

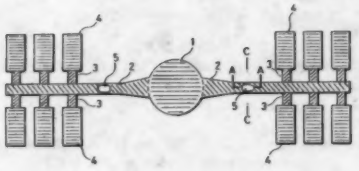
permanently reducing the diameter of said heat recoverable sleeves by heat shrinking whereby said sleeves fit firmly about said wires.

4,908,178

METHOD OF MOLDING A SEMICONDUCTOR DEVICE

Osamu Nakagawa; Koji Yanagitani; Ikuo Sasaki, and Toshinobu Banjo, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 867,590, May 30, 1986, Pat. No. 4,818,204.
This application Jan. 11, 1989, Ser. No. 296,647
Claims priority, application Japan, May 31, 1985, 60-119084
Int. Cl.[4] B29C *45/02, 45/14*
U.S. Cl. 264—272.17 4 Claims



1. A transfer-molding method which employs a metal mold for plastic molding a semiconductor device with thermo-hardening plastic, wherein said metal mold comprises:

a pot section for receiving plastic;

a runner section operatively connected to said pot section for receiving a flow of said plastic from said pot section;

a flow restrictor section mold in the form of an obstruction elongated in the direction of flow in said runner section, wherein said flow restrictor section is positioned medially in said runner section and projects into said runner section so as to permit flow on either side of said flow restrictor section, said flow restrictor section being tapered toward said pot section and away from said pot section, and said flow restrictor section reducing the cross-sectional area of said runner section so as to provide opportunity for complete melting of said plastic a first time so as to reduce the viscosity of said plastic;

a gate section operatively connected to said runner section for receiving said plastic from said runner section, and having a cross-sectional area reduced from that of said runner section to provide a further opportunity for melting said plastic to insure complete melting of said plastic and to reduce the viscosity of said plastic; and

a cavity section operatively connected to said gate section for receiving said plastic and for forming said plastic into a product, whereby said flow restrictor section provides for a reduction in the number of internal voids in said product,

said transfer-molding method comprising:

heating said metal mold to a temperature so as to melt said plastic;

injecting said plastic into said metal mold with an effective injecting pressure and at an effective injecting speed; and

hardening said plastic to form said semiconductor device.

4,908,179

REINFORCED INFLATABLE SEAL

Robert H. Brookins, Somers, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 26, 1985, Ser. No. 749,069
Int. Cl.[4] F16J *15/46*
U.S. Cl. 376—203 8 Claims

1. An arrangement for sealing a gap between two vertical surfaces to provide resistance to downwardly directed forces which would dislodge a seal body from between the vertical surfaces, including,

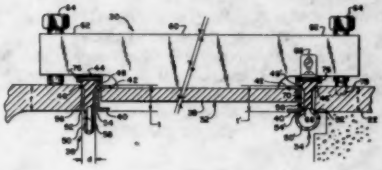
a gap between two parallel vertical surfaces, a flexible seal body in the gap between the parallel vertical surfaces and extending above the surfaces,

and metallic stiffening structure extending horizontally through the seal body above the parallel surfaces to span the gap and thereby to provide resistance to hydrostatic and seismic and mechanical forces applied downwardly on the seal body.

4. A sealing arrangement betwen a flange (24) on a nuclear reactor vessel (10) and a ledge (22) formed by the wall (18) of a reactor vessel cavity (14) in which the reactor vessel is suspended by its nozzles (16) passing through the wall, including

a seal ring (32) having first and second parallel edges (48,54 and 48',54') on its inner and outer radii and positioned in a closely spaced and parallel relationship to first and second parallel edges (46,52) on a vessel flange (24) and first and second parallel edges (46',52') on a ledge (22) of a cavity wall (18),

a first flexible seal (36) disposed in a space between the first and second parallel edges of the vessel flange and the first



and second parallel edges on the inner radius of the seal ring and the flexible seal having an upper end extending up and above the first edges of the vessel flange and the seal ring,

a second flexible seal (34) identical to the first flexible seal and disposed in a space between the first and second parallel edges of the cavity wall ledge and the first and second parallel edges on the outer radius of the seal ring,

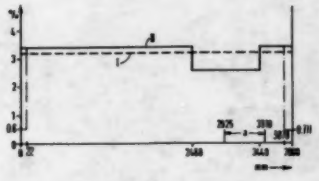
and the upper end (44) of each flexible seal provided with a metallic stiffening structure therein to span the space between said first and second parallel edges above said edges, thereby to provide resistance to hydrostatic and seismic and mechanical forces applied downward on the seals.

4,908,180

PRESSURIZED WATER NUCLEAR REACTOR WITH A FUEL ROD CONTAINING A NUCLEAR FUEL COLUMN ENRICHED TO A VARIABLE EXTENT OVER THE LENGTH OF THE ROD

Horst-Dieter Kiehlmann, Erlangen, and Frank Wunderlich, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 120,866
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639401
Int. Cl.[4] G21C *3/28, 3/62*
U.S. Cl. 376—361 24 Claims



1. Pressurized water nuclear reactor, comprising a reactor core, a nuclear reactor fuel assembly disposed in said reactor core, a fuel rod disposed in said fuel assembly, a nuclear fuel column disposed in said fuel rod being enriched to a variable

extent with fissionable nuclei over the length thereof, said reactor core having an inlet for liquid water acting as coolant closest one end of said fuel rod and of said fuel assembly and an outlet for the liquid water closest to the other end of said fuel rod and of the fuel assembly, a steam generator having a primary tube connected to said inlet and said outlet, one half of said nuclear fuel column at said outlet having an average enrichment being less than the average enrichment of the other half of said fuel column, and said nuclear fuel column having a depletion zone with an average enrichment being less than the average enrichment over the entire length of said column, said depletion zone having two limits spaced from the end of said column closest to said outlet by distances of substantially 10% and 25% of the total length of said column.

4,908,181

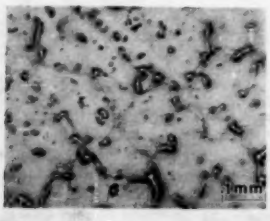
INGOT CAST MAGNESIUM ALLOYS WITH IMPROVED CORROSION RESISTANCE

Santosh K. Das, Randolph, and Chin-Fong Chang, Morris Plains, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 7, 1988, Ser. No. 164,759

Int. Cl.[4] C22C *23/02*

U.S. Cl. 420—405 **6 Claims**



1. A magnesium casting alloy consisting of the formula $Mg_{bal}Al_aZn_bX_c$, wherein X is at least one element selected from the group consisting of neodymium, praseodymium, and yttrium, "a" ranges from about 5 to 15 atom percent, "b" ranges from about 0.2 to 4 atom percent, "c" ranges from about 0.5 to 3 atom percent, the balance being magnesium and incidental impurities, with the proviso that the sum of aluminum and zinc present ranges from about 5 to 15 atom percent.

4,908,182

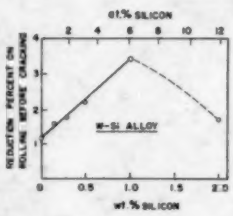
RAPIDLY SOLIDIFIED HIGH STRENGTH, DUCTILE DISPERSION-HARDENED TUNGSTEN-RICH ALLOYS

Sung H. Whang, Huntington, N.Y., assignor to Polytechnic University, Brooklyn, N.Y.

Filed Apr. 11, 1988, Ser. No. 180,080

Int. Cl.[4] C22C *27/04*

U.S. Cl. 420—430 **8 Claims**



1. A tungsten-rich alloy comprising a rapidly solidified, single phase, fine grain mixture of formula

$$W_{100-P}M_XRE_YME_Z$$

wherein:

W is tungsten;

M is one or more elements selected from the group consisting of transition elements;

RE is an element selected from the group consisting of rare earth and actinide elements;

Me is silicon, boron, germanium or aluminum;

X is 0 to 25 weight percent;

Y is 0 to 2 weight percent;

Z is 0.1 to 3 weight percent; and

P equals X+Y+Z where P≦26 weight percent; said alloy having improved ductility and hardness.

4,908,183

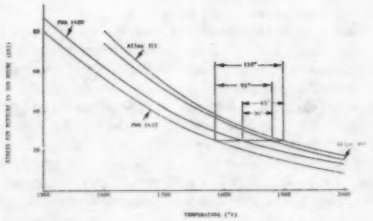
HIGH STRENGTH SINGLE CRYSTAL SUPERALLOYS

Stephen Chin, Wallingford, and David N. Duhl, Newington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 794,025, Nov. 1, 1985, abandoned. This application Mar. 9, 1988, Ser. No. 169,165

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—448 **4 Claims**



1. An alloy composition suitable for casting into a single crystal nickel base superalloy article, the alloy composition consisting essentially of, on a weight percent basis, 4–5.5 Cr, 7.5–12 Co, 1.5–2.5 Mo, 1–6 W, 2–4 Re, 4.5–5.5 Al, 0.5–1.5 Ti, 8–12 Ta, 0–1 V, 0–0.5 Hf, 0.0–0.01 B, 0.0–0.2 Cb, 0.0–0.05 C, 0.0–0.01 Zr, with the balance nickel.

4,908,184

HIGH STRENGTH, CORROSION-RESISTANT ALUMINUM ALLOYS FOR BRAZING

Masaharu Kaifu, Yamaguchi; Jun Takigawa, Tochigi; Hideo Fujimoto, Tochigi; Tomohiro Nishimura, Tochigi, and Masao Takemoto, Tochigi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

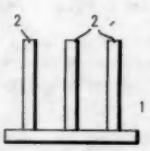
Continuation of Ser. No. 884,655, Jul. 15, 1986, Pat. No. 4,788,037, which is a continuation of Ser. No. 556,594, Nov. 30, 1983, abandoned. This application Aug. 5, 1988, Ser. No. 198,215

Claims priority, application Japan, Nov. 30, 1982, 57-210508

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] C22C *21/16*

U.S. Cl. 420—534 **4 Claims**



1. A high strength, corrosion-resistant alloy for brazing which consists essentially of 0.5–1.0 wt.% of Cu, 0.1–0.5 wt.%

of Mg, 0.2–1.0 wt.% of Si, and one or more of Zr, Cr and Mn each in the amount of 0.05–0.5 wt.%, and the balance of Al and inevitably present impurities, with the weight ratio of Si/Mg being in the range of 1–2.5.

4,908,185

NICHROME RESISTIVE ELEMENT AND METHOD OF MAKING SAME

Charles T. Plough, Jr., Norfolk, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Division of Ser. No. 47,112, May 8, 1987, Pat. No. 4,837,550.
This application Apr. 25, 1988, Ser. No. 186,005
Int. Cl.[4] C22C *30/00*
U.S. Cl. 420—588 2 Claims

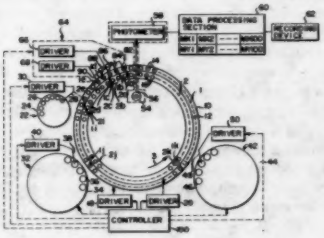
1. In an alloy, adapted for use as a conductor for electrical resistors, said alloy consisting essentially of 30% by weight to 45% by weight nickel and 30% by weight to 45% by weight chromium and in combination therewith, as a corrosion inhibitor and stabilizer, 25% to 35% by weight aluminum and at least one substrate selected from the group consisting of transitional metal elements, and rear earth elements.

4,908,186

AUTOMATED CHEMICAL ANALYZER

Takeshi Sakamaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 8, 1986, Ser. No. 904,644
Claims priority, application Japan, Sep. 11, 1985, 60-199526
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—64 9 Claims



1. An automated chemical analyzer comprising:

a plurality of turntables concentrically arranged, each of said turntables having a circumferential reaction line including a plurality of reaction receptacles disposed coangularly with an interval therebetween;

driving means for rotating each of said turntables independently;

light source means for emitting a light beam passing through a reaction receptacle disposed on a reaction line of one of said turntables and passing through the interval or intervals disposed on the reaction line or lines of said remaining turntables; and

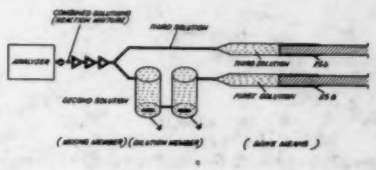
light-measuring measuring means for measuring said light beam, said reaction lines of said turntables disposed between said light source means and said light-measuring means.

4,908,187

DEVICE FOR DILUTING AND MIXING LIQUIDS AND APPLICATIONS FOR KINETIC ANALYSIS

Barton Holmquist, Waltham, Mass., and Robert K. Scopes, Hurstbridge, Australia, assignors to Endowment for Research in Human Biology, Inc., Boston, Mass.

Continuation of Ser. No. 32,546, Apr. 1, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,786
Int. Cl.[4] G01N *33/00*
U.S. Cl. 422—81 9 Claims



1. A device suitable for use in obtaining chemical, biochemical, or physical chemical data on reactions in solution comprising a first and second pulse driven fluid drive means, a fluid dilution member, a fluid mixing member, a control system, and first, second, third, and fourth fluid passageways;

wherein all said fluid passageways are substantially linear, each said passageway having a single proximal end through which a liquid enters and a single distal end through which a liquid exits;

said first pulse driven fluid drive means being functionally affixed to the proximal end of said first fluid passageway;

said fluid dilution member comprising 1 dilution chamber or 2 interconnected dilution chambers, said fluid dilution member having an incipient end and an excipient end, wherein said incipient end of said dilution member is functionally affixed to the distal end of the first fluid passageway and wherein said excipient end of said dilution member is functionally affixed to said proximal end of said second fluid passageway;

said second pulse driven fluid driven means being functionally affixed to said proximal end of said third fluid passageway;

said fluid mixing member having an incipient end and an excipient end, said fluid mixing member comprising a fluid passageway diverging and reconverging 1–6 times, said incipient end of said fluid mixing member being functionally affixed to both said distal ends of said second and third fluid passageways respectively, and said excipient end of said fluid mixing member being functionally affixed to said proximal end of said fourth fluid passageway;

wherein said first and second pulse driven fluid drive means, said first, second, third and fourth fluid passageways, said fluid dilution member and said mixing member form a liquid filled closed system such that displacement of a volume of liquid at one end of the system forces the displacement of a substantially equal volume of liquid at the other end of the system;

said control system operatively associated with both said first pulse driven fluid drive means and said second pulse driven fluid drive means;

whereby when said control system associates with both said first pulse driven fluid drive means and said second pulse driven fluid drive means, it causes the displacement (pumping) of a volume of liquid from said first pulse driven fluid drive thereby pumping a volume of a first solution into a substantially larger volume of a transforming solution contained within said fluid diluting member via said first fluid passageway, and causing displacement of an equal volume of said transformed solution from said dilution member to said fluid mixing member, and said second pulse driven fluid drive thereby pumping a volume of a third solution into and through said fluid mixing member via said third fluid passageway, such that both

said third solution and said transformed solution converge at or near the incipient end of said mixing member and are mixed during displacement through said mixing member thereby forming a combined homogeneous solution being further displaced by said combined pulses into and out of the distal end of said fourth fluid passageway, said combined homogeneous solution becoming variably less dilute in the components of said first solution with each successive pulse.

4,908,188

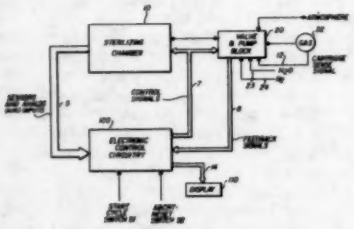
GAS STERILANT SYSTEM

Raymond P. Jefferis, III, Wayne, Pa.; Phillip V. Engler, Tarrytown, and Aaron A. Rosenblatt, New York, both of N.Y., assignors to The Scopas Technology Company, Inc., New York, N.Y.

Continuation of Ser. No. 698,434, Feb. 5, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 183,514

Int. Cl.[4] A61L *2/24*

U.S. Cl. 422—111 **50 Claims**



1. Apparatus for treating articles with a gas, comprising:

chamber means for receiving an article to be treated;

means for supplying a gas to the chamber means comprising first valve means coupled to the chamber means for supplying the gas to the chamber means, means for removing the gas from the chamber means after a predetermined time interval, means for measuring a plurality of measured parameters in said chamber means and for generating a plurality of electrical signals associated with ones of the measured parameters, electronic control means receiving said plurality of electrical signals associated with ones of the measured parameters from said chamber means for controlling said valve means and said means for removing, said electronic control means comprising computer means for cycling said apparatus through a plurality of states in accordance with a predetermined sequence of instructions, said computer means including means for aborting the operation of said apparatus to one of a plurality of defined failure states having predefined conditions in response to a failure of said apparatus, said selected failure state dependent on the state in said cycle in which the failure occurred, and further comprising means for cycling said apparatus in accordance with said predetermined sequence to a further defined state once one of said defined failure states is reached, said further defined state comprising one of the states in accordance with said predetermined sequence of instructions, said further defined state being dependent on the defined failure state reached and being a state which maintains said apparatus within acceptable standards of safety.

4,908,189

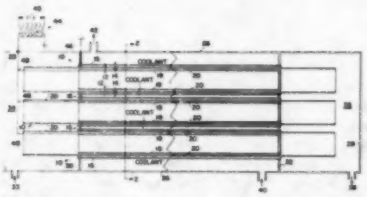
CONCENTRIC TUBE OZONATOR

Ernst J. Staubach, Loveland, Ohio, assignor to Henkel Corporation, Ambler, Pa.

Filed Jul. 15, 1988, Ser. No. 219,525

Int. Cl.[4] B01J *19/08, 19/12;* **C01B** *13/11*

U.S. Cl. 422—186.19 **13 Claims**



1. An ozonator designed to produce ozone efficiently with minimum electrical power consumption, comprising a plurality of concentric tube assemblies forming the ozonator in which a feed gas containing oxygen is converted into ozone in inner and outer concentric annular electrical field discharge gaps formed therein, with each concentric tube assembly being designed to provide for replacement of the components thereof and also for precise positioning of the components thereof for efficient operation of the ozonator, wherein each concentric tube assembly comprises an outer tubular metal electrode, an inner tubular metal electrode positioned concentrically within the outer tube electrode, and a glass dielectric tube positioned concentrically and centrally between said outer tubular electrode and said inner tubular electrode to provide an inner concentric annular electrical field discharge gap between said glass dielectric tube and said inner tubular electrode and an outer concentric annular electric discharge gap between said glass dielectric tube and said outer tubular electrode, in which feed gas is converted into ozone, each inner and outer annular discharge gap being in the range o 0.45 mm to 0.55 mm to provide a minimum gap to convert oxygen to ozone to minimize the voltage required to produce ozone, said glass dielectric tube having a thickness of less than 1.1 mm to minimize the voltage required to produce ozone, a common feeder gas inlet at a first axial end of the concentric tube assemblies, and a common ozone gas outlet at the second, opposite axial end of the concentric tube assemblies, a periodic power supply for applying a periodic electrical power supply between the inner and outer concentric tubular electrodes during operation of the ozonator, and a cooling system for the ozonator defining a cooling housing encompassing the concentric tube assemblies such that a coolant can circulate in said cooling housing and around the outsides of the outer tubular electrodes for cooling thereof during operation of the ozonator.

4,908,190

CHEMICAL DISPENSING DEVICE

Murrill W. Maglio, West Palm Beach, and Stephen D. Moore, Lake Worth, both of Fla., assignors to Universal Chemical Feeder, Inc., West Palm Beach, Fla.

Filed Dec. 31, 1987, Ser. No. 139,974

Int. Cl.[4] B01D *11/02, 12/00*

U.S. Cl. 422—276 **7 Claims**

1. A device for dispensing chemical into a pipeline transporting liquid under pressure, the device operating in a first mode when the pressure in the pipeline is variable, and operating in a second mode when the pressure in the pipeline is substantially constant, the device comprising:

a conduit adapted to be disposed in-line with the pipeline, said conduit defining a liquid flow path and having an upstream end, a downstream end, a first conduit opening disposed between said upstream and downstream ends, and a second conduit opening disposed between said first

conduit opening and said upstream end, said conduit also including venturi effect means for causing the fluid pressure proximate said first conduit opening to be lower than the fluid pressure proximate said second conduit opening;

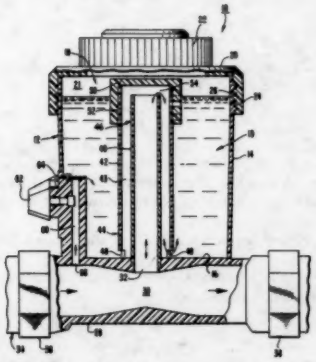
an enclosure having a bottom end and a top end, the enclosure having a first enclosure opening disposed on said bottom end and a second enclosure opening;

means for connecting said first enclosure opening to said first conduit opening for liquid communication between said enclosure and said conduit;

means for connecting said second enclosure opening to said second conduit opening for liquid flow from said conduit to said enclosure;

means for introducing chemical into said enclosure;

first valve means for restricting fluid flow from said enclosure to said conduit through said second enclosure opening, said first valve means allowing fluid flow from said conduit to said enclosure through said second enclosure opening; and



elongated tube means extending from said first enclosure opening toward said top end of said enclosure, said elongated tube means directing at least a portion of the liquid exiting said enclosure from said bottom end towards said top end to mix chemical in said enclosure with said liquid exiting from said enclosure through said first enclosure opening, wherein in said first mode of operation, said liquid enters and exits said enclosure through said first enclosure opening in response to differences in pressure between said conduit and said enclosure, and wherein in said second mode of operation, said liquid enters said enclosure through said second enclosure opening and exits said enclosure through said first enclosure opening in response to the venturi effect of said venturi effect means.

4,908,191

REMOVING ARSINE FROM GASEOUS STREAMS

Steven I. Boldish, and Irfan A. Toor, both of Plano, Tex., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 21, 1987, Ser. No. 75,957

Int. Cl.[4] B01D *53/34*; C01G *28/00*

U.S. Cl. 423—210 **19 Claims**

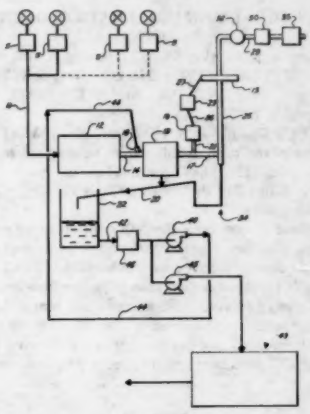
1. A method for removing arsine from a gaseous effluent stream which comprises:

(a) burning the arsine in the gaseous effluent stream in the presence of oxygen to form arsenic oxide and a gaseous discharge stream having entrained therein at least a portion of the arsenic oxide so formed;

(b) removing the arsenic oxide from the gaseous effluent stream by washing the same with an aqueous spray thereby forming an aqueous solution of arsenic oxide and an essentially arsenic-free moisture-containing gaseous stream;

(c) recovering water from said moisture-containing gaseous stream to form a drier gaseous effluent stream;

(d) maintaining said effluent stream, said discharge stream, said moisture-containing gaseous stream and said drier gaseous effluent stream under a pressure of −1 to −2 inches of water;



(e) recirculating at least a portion of said aqueous solution to said aqueous spray and thereby forming a progressively enriched aqueous solution of arsenic oxide; and

(f) precipitating an insoluble arsenic-containing compound from at least a portion of the enriched aqueous solution of arsenic oxide before the solution becomes saturated with arsenic oxide.

4,908,192

VEHICLE EXHAUST GAS SYSTEMS

Philip G. Harrison, Keyworth, and Peter J. F. Harris, Cambridge, both of Great Britain, assignors to TI Corporate Services Limited, United Kingdom

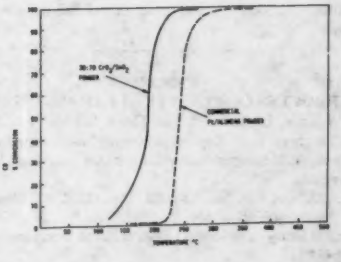
PCT No. PCT/GB87/00563, § 371 Date Mar. 10, 1988, § 102(e) Date Mar. 10, 1988, PCT Pub. No. WO88/00859, PCT Pub. Date Feb. 11, 1988

PCT Filed Aug. 7, 1987, Ser. No. 163,819

Claims priority, application United Kingdom, Aug. 8, 1986, 8619456

Int. Cl.[4] B01D *53/36*

U.S. Cl. 423—213.2 **8 Claims**



1. A method for the catalytic oxidation of carbon monoxide and unburnt hydrocarbon components of vehicle exhaust gas streams, which comprises using as the catalyst a mixed oxide

catalyst composition consisting of tin (IV) oxide (SnO_2) and chromium (VI) oxide (CrO_3) free from platinum and other noble metals or noble metal oxides, and containing a Sn:Cr weight ratio (calculated as SnO_2:CrO_3) in the range of 1:99 to 99:1, said catalyst composition having been obtained by impregnating tin (IV) oxide (SnO_2) with chromium (VI) oxide (CrO_3) and calcining the resulting product.

4,908,193

NO REDUCTION USING SUBLIMATION OF CYANURIC ACID

Perry Robert A., P.O. Box 5024, Livermore, Calif. 94550

PCT No. PCT/US87/01029, § 371 Date Jan. 5, 1988, § 102(e) Date Jan. 5, 1988, PCT Pub. No. WO87/06923, PCT Pub. Date Nov. 19, 1987

PCT Filed May 5, 1987, Ser. No. 154,247

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] B01J *8/00*; C01B *17/00*

U.S. Cl. 423—235 **21 Claims**

1. A method of reducing the NO content of an exhaust gas stream generated by combustion comprising contacting the exhaust gas stream generated by combustion with an amount of gaseous HNCO at a temperature effective for heat induced decomposition of HNCO, said amount and temperature being effective for resultant lowering of the NO content of the exhaust gas stream and said contacting being effected by adding gaseous HNCO directly to said exhaust gas stream.

4,908,194

METHOD FOR BAGHOUSE BROWN PLUME POLLUTION CONTROL

Richard G. Hooper, Littleton, Colo., assignor to NaTec Mines Ltd., Houston, Tex.

Filed Mar. 29, 1988, Ser. No. 174,654

Int. Cl.[4] B01J *21/00, 8/00*; C01B *17/00*

U.S. Cl. 423—235 **12 Claims**

1. An SO_x/NO_x air pollution control process employing a baghouse to simultaneously control particulate emissions comprising the steps of:

(a) introducing a sodium-based reagent into a stream of flue gas containing SO_x and NO_x, said flue gas having a temperature above about 200° F.;

(b) introducing urea as an additive into said flue gases in an amount ranging from about 1 to about 25% by weight of said sodium-based reagent;

(c) maintaining said reagent and said additive in contact with said flue gas for a time sufficient to react said reagent with some of said SO_x and NO_x thereby reducing the concentration of said SO_x and NO_x in said flue gas;

(d) said additive, as compared to use of said reagent without said additive, increasing the percent SO_x removal and the percent NO_x removal by said reagent while suppressing conversion of NO to NO_2 by said reagent to below about the visible brown plume threshold; and

(e) collecting said reacted reagent and additive in a baghouse.

4,908,195

PROCESS OF PURIFYING EXHAUST GAS

Dieter Wanner, Liederbach, and Horst Schade, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfut am Main, Fed. Rep. of Germany

Continuation of Ser. No. 136,904, Dec. 22, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,746

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644102

Int. Cl.[4] B01J *8/00*; C01B *7/00, 21/00, 17/00*

U.S. Cl. 423—239 **14 Claims**

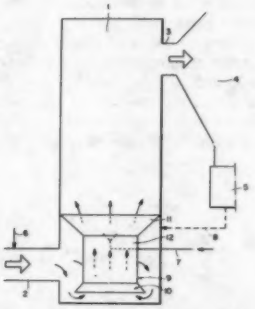
1. A process of purifying an exhaust gas comprising:

(a) providing an exhaust gas stream at a temperature of about 350° to 450° C. containing dust and gaseous pollutants including SO_2, HCl and nitrogen oxides;

(b) introducing a dry solid absorbent into the gas stream in an amount of 70 to 90% of total required absorbent;

(c) contacting the gas stream with a fixture to produce a turbulence in the gas stream;

(d) adding the remainder of the total required absorbent as a



solution or suspension to the turbulent gas stream in an amount so that the temperature of the exhaust gas is decreased in an amount of not more than 15° C. to produce a treated gas stream;

(e) removing dusts and solids from the treated gas stream; and

(f) catalytically treating the treated gas stream to remove nitrogen oxide therefrom.

4,908,196

BORIC OXIDE PREPARATION METHOD

Antonio Vasconi, Melegnano, and Paolo Mazzinghi, Pomarance, both of Italy, assignors to Societa Chimica Larderello S.p.A., Milan, Italy

Filed Jun. 29, 1987, Ser. No. 68,040

Claims priority, application Italy, Jul. 16, 1986, 21142 A/86

Int. Cl.[4] C01B *35/10*

U.S. Cl. 423—278 **6 Claims**

1. A process for preparing boric oxide substantially free of impurities derived from the corrosion of the production apparatus in which the boric oxide is in the form of a spongy, friable mass, said process comprising:

(a) gradually heating solid boric acid without melting at least a substantial portion of said boric acid to a temperature not exceeding about 150° C. at below atmospheric pressure until said boric acid is at least substantially converted into solid metaboric acid;

(b) gradually heating said solid metaboric acid without melting at least a substantial portion of said metaboric acid to a temperature not exceeding about 400° C. at below atmospheric pressure until said metaboric acid is at least substantially converted into said boric oxide; and

(c) recovering said boric oxide, wherein said boric acid, metaboric acid and boric oxide do not adhere to the production apparatus.

4,908,197

ALUMINUM NITRIDE FLAKES AND SPHERES

John D. Bolt, Landenberg, Pa.; Walter Mahler, Wilmington; Frederick N. Tebbe, Hockessin, both of Del., and Robert J. Young, Jr., Gibbstown, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 903,486, Sep. 4, 1986, abandoned. This application Apr. 7, 1989, Ser. No. 334,612

Int. Cl.[4] C01B *21/072*

U.S. Cl. 423—412 **17 Claims**

1. A method for making aluminum nitride comprising:

(i) reacting R_3Al and ammonia to produce RAlNH intermediate of irregular shape,

(ii) converting the irregularly shaped RAlNH to spheres or flakes in a liquid medium, and

(iii) heating the RAlNH spheres or flakes to form aluminum nitride of corresponding shape;

wherein R is selected from at least one member of the group C_xH_{2x+1} where x is 1 to 20.

16. A suspension of spherical particles of RA1NH in a liquid medium wherein R is selected from at least one member of the group C_xH_{2x+1}, where x is 1–20.

17. A suspension of flakes of RA1NH in a liquid medium wherein R is selected from at least one member suspension of C_2H_5AlNH. The suspension was treated of the group C_xH_{2x+1}, where x is 1–20.

4,908,198

FLUORINATED CARBONS AND METHODS OF MANUFACTURE

Norman L. Weinberg, E. Amherst, N.Y., assignor to The Electrosynthesis Company, Inc., East Amherst, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,286

Int. Cl.[4] C01B *31/00*

U.S. Cl. 423—415 R **35 Claims**

1. A method of making a specifically fluorinated carbon, which comprises the steps of preoxidizing a carbon, and fluorinating the preoxidized carbon by specific fluorination to form a preoxidized, specifically fluorinated carbon.

4,908,199

$CO+H_2O$ CATALYTIC CONVERSIONS

Guy-Noël Sauvion, Chevilly Larue, and Jack Caillod, Taverny, both of France, assignors to Pro-Catalyse, Rueil Malmaison, France

Division of Ser. No. 38,000, Apr. 14, 1987, which is a division of Ser. No. 813,822, Dec. 27, 1985, abandoned. This application Nov. 7, 1988, Ser. No. 268,380

Claims priority, application France, Dec. 28, 1984, 84 19974

Int. Cl.[4] C01B *31/20*

U.S. Cl. 423—437 **9 Claims**

1. A process for the conversion of carbon monoxide and water into hydrogen and carbon dioxide, comprising reacting carbon monoxide with water vapor in the presence of a catalytically effective amount of thio-resistant catalyst which comprises an active phase deposited onto a support, said active phase consisting essentially of molybdenum, and a cobalt and-/or nickel promoter therefor, and said support comprising cerium oxide.

4,908,200

METHOD FOR PRODUCING ELASTIC GRAPHITE STRUCTURES

Masaki Fujii, Chikushino, and Masanori Minohata, Izumi, both of Japan, assignors to Kao Oil Company, Limited, Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,645

Claims priority, application Japan, Jul. 1, 1987, 62-164808

Int. Cl.[4] C01B *31/04*

U.S. Cl. 423—448 **4 Claims**

1. A method for producing graphite structures from a carbonaceous material, which comprises in succession the steps of:

(a) treating said carbonaceous material with nitric acid or a nitric-sulfuric acid mixture;

(b) bringing the acid-treated carbonaceous material into contact with a basic aqueous solution to make it soluble;

(c) adding an acidic aqueous solution to the obtained soluble matter to regulate the pH of said soluble matter to 3 or less, thereby precipitating a carbonaceous component therefrom; and

(d) graphitizing the thus precipitated carbonaceous component at 2,400° C. or higher temperature.

4,908,201

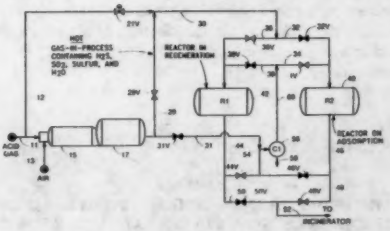
SULFUR RECOVERY PROCESS INCLUDING REMOVAL OF RESIDUAL SULFUR FROM CLAUS CATALYST AFTER REGENERATION

Boyd E. Cabanaw, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 824,896, Jan. 31, 1986, abandoned. This application Oct. 14, 1986, Ser. No. 918,226

Int. Cl.[4] C01B *17/04*

U.S. Cl. 423—574 R **26 Claims**



1. In a process for the recovery of sulfur comprising passing an acid gas feedstream having as a sulfur species essentially only hydrogen sulfide therein to a Claus plant comprising a thermal conversion zone and at least one Claus catalytic reaction zone operated under adsorption conditions including temperature for forming and depositing a preponderance of sulfur formed on catalyst therein, the steps of:

vaporizing deposited sulfur from the resulting sulfur-laden catalyst in said Claus catalytic reaction zone in the presence of a gas-in process richer in hydrogen sulfide and sulfur dioxide than the gas contacting the catalyst under said adsorption conditions, then

stripping residual sulfur and sulfur compounds from the catalyst resulting from such vaporizing step by passing a portion of the acid gas feedstream comprising as a sulfur species essentially only hydrogen sulfide through catalyst in said Claus catalytic conversion zone at a inlet temperature less than the inlet temperature of gas into said catalytic conversion zone during adsorption conditions and at a rate and for a time effective for stripping residual sulfur and sulfur compounds from the catalyst to a level such that emissions from such zone after being placed on-stream with a feedstream leaner in sulfur and sulfur compounds than utilized before thus passing the portion of the acid gas feedstream to the Claus plant therethrough at least do not exceed the quantity of sulfur atoms entering such zone;

providing the resulting gas-in-process containing the thus stripped sulfur and sulfur compounds to a Claus conversion step; and

returning the catalytic reaction zone having catalyst thus stripped of residual sulfur and sulfur compounds to adsorption conditions with a feedstream leaner in hydrogen sulfide and sulfur dioxide than utilized during the vaporizing step, thereby preventing emissions from such zone after being placed on stream with such feedstream from exceeding the quantity of sulfur atoms entering such zone during adsorption.

4,908,202

USE OF 2-OXO-1-PYRROLIDINEACETAMIDE FOR THE DETERMINATION OF THE GLOMERULAR FILTRATION RATE IN HUMANS

Hans-Ulrich Schulz, Bad Schwartau, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,793

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1988, 3802996

Int. Cl.[4] A61K *49/00, 31/40*; G01N *31/00, 33/48*

U.S. Cl. 424—9 9 Claims

1. A method for determining the glomerular filtration rate of a urine-producing subject which comprises administering a suitable known dose between about 800 and 300 mg. of piracetam to said subject, withdrawing blood samples from said subject at spaced time intervals after an initial latency time, and measuring the differences in the amounts of piracetam present in said blood samples over said time intervals and calculating the clearance.

4,908,203

METHOD FOR INDUCING HIV NEUTRALIZING ANTIBODIES USING AN INTERNAL IMAGE IDIOTOPE

George B. Thornton, Rancho Bernardo, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Sep. 9, 1987, Ser. No. 95,467

Int. Cl.[4] A61K *39/00, 39/42, 45/02*; G01N *33/53*

U.S. Cl. 424—86 6 Claims

1. A method for inducing HIV neutralizing antibodies comprising administering an immunologically effective amount of an OKT4A antibody molecule homolog.

4,908,204

REVERSIBLY BLOCKED PLASMIN, T-PA HYBRID FIBRINOLYTIC ENZYMES AND PHARMACEUTICAL COMPOSITIONS AND ANTI-THROMBOTIC USE THEREOF

Jeffery H. Robinson, Epsom, and Ian Dodd, Dorking, both of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 684,593, Dec. 21, 1984. This application Feb. 22, 1988, Ser. No. 158,581

Claims priority, application United Kingdom, Dec. 24, 1983, 8334498

Int. Cl.[4] A61K *37/62, 37/547*; C12N *9/48, 9/68*

U.S. Cl. 424—94.2 10 Claims

6. A method of treating a patient suffering from a thrombotic disease, which comprises administering to the sufferer an effective non-toxic amount of a fibrinolytically active hybrid protein comprising plasmin A-chain covalently linked to tissue plasminogen activator B-chain, said hybrid protein having a catalytic site essential for catalytic activity.

4,908,205

STABILIZED HUMAN TISSUE PLASMINOGEN ACTIVATOR COMPOSITIONS

William F. Bennett, San Francisco; Stuart E. Builder, Belmont, and Larry A. Gatlin, Concord, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 811,081, Dec. 17, 1985, Pat. No. 4,777,043. This application Mar. 28, 1988, Ser. No. 173,854

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.[4] A61K *37/547, 31/195*

U.S. Cl. 424—94.64 17 Claims

1. A pharmaceutical composition comprising a pharmaceutically effective amount of human tissue plasminogen activator and a pharmaceutically acceptable argininium ion containing buffer, said composition having a chloride ion concentration of less than about 0.3M, and a pH of approximately 5.

4,908,206

EXTRACTS OF EMBRYONIC ORGANS, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL PREPARATION CONTAINING THEM

Rolf Schäfer, and Hans Hitz, both of Arisdorf, Switzerland, assignors to Amics AG, Oberwil, Switzerland

Filed Sep. 10, 1987, Ser. No. 95,581

Claims priority, application Switzerland, Sep. 16, 1986, 3724/86

Int. Cl.[4] A61K *35/54, 35/23, 35/34, 35/407*

U.S. Cl. 424—95 18 Claims

1. In a process for preparing an extract of finely divided embryonic mammalian organs, which is free of non-polar constituents and constituents having a high molecular weight, by treatment with a mixture of water and a water soluble organic solvent, the improvement comprising

(a) dispersing in said solvent mixture a finely divided embryonic mammalian organ, excluding brains and embryonic glands which produce hormones,
said mixture containing at least 70 volume percent of said organic solvent and having a pH of 6–8;

(b) vigorously stirring and refluxing said dispersion at atmospheric pressure for at least two hours while maintaining said pH;

(c) cooling the dispersion to a temperature below 8° C.;

(d) separating the liquid from the solids;

(e) subjecting said separated liquid to a vacuum to evaporate the liquid leaving a dry residue;

(f) diluting said residue with water and stirring at a temperature of 75°–85° C. for 30 minutes to 2 hours;

(g) cooling said diluted residue to a temperature below 8° C. to remove solids and discarding said solids; and

(h) filtering said cooled diluted residue using an ultramembrane filter to remove any constituents having a molecular weight greater than 5000 daltons.

4,908,207

METHOD OF TREATMENT OF A PERSON HAVING A COMPROMISED HUMAN IMMUNE SYSTEM

Said I. Hakky, 8547 Merrimoor Blvd. East, Largo, Fla. 33543-2536

Filed Apr. 27, 1987, Ser. No. 43,002

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[4] A61K *35/78, 31/34, 31/12, 31/045*

U.S. Cl. 424—195.1 3 Claims

1. A method of treatment of a person having a compromised human immune system comprising the steps of administering to said person a therapeutic amount of a composition having at least one terpenoid found in the plant Cyperus rotundus Linn in a pharmaceutically effective amount in a pharmaceutically acceptable carrier to such person.

4,908,208

MATRIX FOR RELEASE OF ACTIVE INGREDIENTS

Chi-Long Lee, and Gerald A. Gornowicz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 22, 1988, Ser. No. 184,731
Int. Cl.[4] A01N *25/08*
U.S. Cl. 424—409 7 Claims

1. In a system for delivering an active substance to the atmosphere:

a matrix containing an active ingredient, said matrix comprising a substantially linear thermoplastic block copolymer which is a reaction product of a polydiorganosiloxane which forms soft segments in said reaction product and a diisocyanate which forms hard segments, said copolymer having a glass transition temperature between 45° C. and 160° C. said soft segments forming from about 70 to 99 percent by weight, based on the weight of said copolymer, said hard segments forming about 1 to 30 weight percent, based on the weight of said copolymer, the average molecular weight of said copolymer being between about 30,000 and 500,000, said active substance being an insect sex pheromone, a bactericide, an herbicide, a plant growth regulator, or an insect repellant.

4,908,209

BIOCIDAL DELIVERY SYSTEM OF PHOSPHATE ESTER AND METHOD OF PREPARATION THEREOF

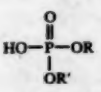
Robert H. McIntosh, Jr., Greensboro, N.C.; Albin F. Turbak, Sandy Springs, Ga., and Robert H. McIntosh, Sr., Greensboro, N.C., assignors to Interface, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 47,561, Apr. 27, 1987, which is a continuation-in-part of Ser. No. 781,710, Oct. 2, 1985, which is a continuation-in-part of Ser. No. 635,728, Oct. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 713,445, Mar. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 736,652, May 21, 1985, Pat. No. 4,647,601, which is a continuation-in-part of Ser. No. 744,730, Jun. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 570,952, May 21, 1985, and a continuation of Ser. No. 523,734, Aug. 16, 1983, abandoned, which is a continuation of Ser. No. 226,006, Jan. 19, 1981, abandoned, which is a continuation of Ser. No. 930,879, Aug. 4, 1978, abandoned. This application May 5, 1988, Ser. No. 190,370
Int. Cl.[4] A01N *25/08*
U.S. Cl. 424—409 22 Claims

1. A biocidal composition comprising

(a) an inert carrier wherein the carrier is a synthetic or natural polymer selected from the group consisting of proteins, polysaccharides, hydrocarbon polymers, and derivatives thereof and

(b) a biocidally effective amount of a phosphate ester having the general formula:



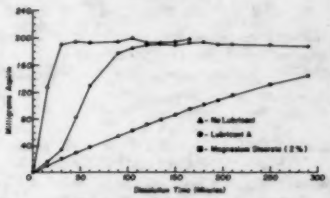
wherein R and R' are selected from the group consisting of alkyl, aryl, aralkyl and alkaryl groups, one of R or R' can be H, and there is at least one free hydroxyl group, and the phosphate ester is bound to the carrier.

4,908,210

LACTYLIC SALT TABLET FORMULATIONS AND TABLETS

Michael W. Adams, Bluff City, and Shabir Z. Masih, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,120
Int. Cl.[4] A61K *47/00, 9/50*
U.S. Cl. 424—439 6 Claims



1. A formulation in powder form and adapted to be formed and compressed into tablets comprising an active ingredient and from about 0.5 to about 5.0%, based on the total weight of the formulation, of a lubricant which comprises

(a) about 20–40% by weight of monoglycerides having an iodine value of about 2–15,

(b) about 40–70% by weight of propylene glycol monoesters, and

(c) about 5–20% by weight of a salt of a fatty acid ester of lactylic acid.

4,908,211

CHEWING GUM AND INGREDIENTS TO CHEMICALLY INHIBIT FORMATION OF PLAQUE AND CALCULUS

Armando F. Paz, 1475 S. Miami Ave., Miami, Fla. 33130

Continuation-in-part of Ser. No. 904,550, Sep. 8, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,652
Int. Cl.[4] A23G *3/30*
U.S. Cl. 424—440 14 Claims

1. A chewing gum comprising gum base and sanguinarine, in an amount effective to inhibit plaque formation.

4,908,212

CHEWING GUM DESIGNED TO PREVENT TOOTH DECAY BY BLENDING A SOLUBLE EXTRACT OF CACAO BEAN HUSK

Ik B. Kwon; Hyung H. Park, both of Seoul, and Bong J. An, Kyungpuk, all of Rep. of Korea, assignors to Lotte Confectionery Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 13, 1989, Ser. No. 296,998
Claims priority, application Rep. of Korea, Nov. 10, 1988, 1988-14761
Int. Cl.[4] A61G *47/00*
U.S. Cl. 424—440 1 Claim

1. A chewing gum composition which aids in the prevention of tooth decay comprising the dried water soluble or ethanol soluble extract of cacao bean husk in the ratio of 0.1–1.0 weight percent of the composition, wherein said extract inhibits glucan synthesis.

4,908,213

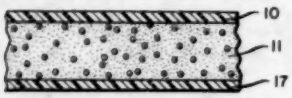
TRANSDERMAL DELIVERY OF NICOTINE

Sharad K. Govil, Plantation, and Paul Kohlman, Deerfield Beach, both of Fla., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 21, 1989, Ser. No. 313,103
Int. Cl.[4] A61L *15/00*; A61B *5/00*
U.S. Cl. 424—447 14 Claims

1. An adhesive, polymeric matrix or reservoir transdermal

delivery patch for the controlled release of nicotine comprising an amount of nicotine or a pharmaceutically acceptable salt or solvate thereof effective to treat symptoms associated with



tobacco smoking cessation and an amount of an antipruritic effective to treat the pruritis associated with transdermal delivery of nicotine, in a pharmaceutically acceptable carrier.

4,908,214

PHARMACEUTICAL TABLET FOR THE TREATMENT OF URAEMIA

Jean-Marc Bobee, and Christian Melin, both of Verrières le Buisson, France, assignors to Synthelabo, Paris, France

Filed Jun. 10, 1988, Ser. No. 204,813

Claims priority, application France, Jul. 23, 1987, 87 10406

Int. Cl.[4] A61K *9/38*

U.S. Cl. 424—477 **16 Claims**

1. A tablet consisting of (1) a core comprising a mixture of salts formed from basic α-amino acids and α-keto analogues of branched-chain essential amino acids and (2) a gastroresistant or gastrosoluble coating.

4,908,215

HYPOCHLORITE COMPOSITIONS CONTAINING THIOSULFATE AND USE THEREOF

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Continuation-in-part of Ser. No. 836,694, Mar. 6, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,016

Int. Cl.[4] A61K *33/14*

U.S. Cl. 424—661 **26 Claims**

1. A process for disinfecting, sterilizing, bleaching and/or cleansing a liquid or a surface comprising:

producing an aqueous solution of hypochlorite, an alkali metal or alkaline earth thiosulfate and a prebuffer wherein the hypochlorite has an initial concentration of about 5–5,000 parts per million available chlorine and the molar ratio of thiosulfate to hypochlorite is between 0.25 to 1 and 0.75 to 1;

adjusting the initial pH of the solution to between 9.0 and 11.0;

contacting the surface or liquid with the solution until the hypochlorite is consumed, wherein the prebuffer allows the pH of the solution to decrease as the hypochlorite is consumed by the thiosulfate, the lifetime of the hypochlorite being dependent on the initial pH of the solution.

4,908,216

APPARATUS FOR THE PRODUCTION OF LOW TENSION MOULDED PARTS

Josef Düllings, Issum; Werner Klöker; Dieter Freitag, both of Krefeld; Holger Lasgen, Solingen; Helmut Schmid, Krefeld, and Helmut Winchenbach, Meerbusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

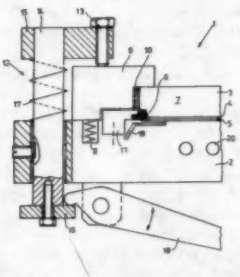
Continuation of Ser. No. 64,747, Jun. 22, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,427

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622540

Int. Cl.[4] B29C *35/08*

U.S. Cl. 425—3 **3 Claims**

1. Apparatus for the production of low tension molded parts from masses with a viscosity of less than 1000 mPas capable of reactive hardening and/or cross-linking, the apparatus consisting of a lower mold part having a disc shaped recess therein for receiving a matrix to be molded, an upper mold part, a clamping device for moving the mold parts toward and away from one another, at least a portion of the upper mold part consisting of transparent material which transmits rays in a predetermined operating range without significant absorption, and an



elastic seal fixed to one of the mold parts and positioned between the upper and lower mold parts at an outer peripheral portion of the recess in the lower mold part to prevent escape of the mass upon molding and allow both mold parts to follow the part being molded to its desired final thickness.

4,908,217

APPARATUS FOR MAKING TILES OR SLABS

Charles K. Colley, Beaumaris, Great Britain, assignor to Robert Abraham Limited, Merseyside, England

PCT No. PCT/GB86/00212, § 371 Date Feb. 6, 1987, § 102(e) Date Feb. 6, 1987, PCT Pub. No. WO86/06019, PCT Pub. Date Oct. 23, 1986

PCT Filed Apr. 15, 1986, Ser. No. 14,051

Claims priority, application United Kingdom, Apr. 18, 1985, 8509920; Jan. 9, 1986, 8600455

Int. Cl.[4] B28B *5/02*

U.S. Cl. 425—253 **10 Claims**

1. Apparatus for making tiles or slabs such as roofing tiles and paving tiles from castable material, comprising an endless conveyor, a sequence of platens on the endless conveyor forming a substantially continuous surface, a series of plates on the substantially continuous surface, and dividers extensible between adjacent plates to at least partially sever a layer of castable material charged and compacted onto the plates, and further comprising a charging stage for said castable material, the charging stage comprising means for positively discharging the castable material onto the plates on the conveyor and compaction means for bearing down on such positively discharged castable material, and wherein means for discharging castable material comprises a helically bladed roller and a pressure roller, the bladed roller being tapered and indented and having a canted axis to as to be effective to produce a continuous substantially even stream of castable material to a position below the pressure roller.

4,908,218

ZEOLITES IN POULTRY NUTRITION

Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 42,987, Apr. 27, 1987, which is a continuation of Ser. No. 846,188, Mar. 3, 1986, abandoned, which is a continuation of Ser. No. 741,572, Jun. 5, 1985, abandoned, which is a division of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564. This application Jan. 19, 1988, Ser. No. 145,232

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] A23K *1/00*

U.S. Cl. 426—2 22 Claims

1. A process for increasing the yield of collectable eggs of a laying poultry hen, said process comprising providing to the hen a daily diet which contains less than 0.15 weight percent chlorine as chloride, and which contains from about 0.25 to about 3.0 weight percent zeolite A.

4,908,219

PROCESS FOR FERMENTATION

Marcel Modot, Canet; Philippe De Lapasse, Landorthe, and Francois Maistre, Villeneuvette, all of France, assignors to Societe Cooperative Agricole de Canet, Canet, France

Filed Jul. 14, 1988, Ser. No. 218,978

Claims priority, application France, Jul. 22, 1987, 87 10375

Int. Cl.[4] C12G *1/00*

U.S. Cl. 426—15 5 Claims

1. A vinification process using at least one fermentation vat from which escapes during fermentation a vapor mixture of water vapor, aroma constituents, alcohols and CO_2, said process comprising subjecting at least a part of said vapor mixture to a first condensation at a temperature comprised between −5° C. and −15° C. thereby to produce a first condensate and a further vapor mixture rich in alcohols and aroma constituents, and subjecting said further vapor mixture to a second condensation at a temperature comprised between −15° C. and −50° C., thereby to produce a second condensate rich in alcohols and aroma constituents, wherein at least a part of said second condensate is reintroduced in the fermentation vat.

4,908,220

FEATHER-LYSATE, A HYDROLYZED FEATHER FEED INGREDIENT AND ANIMAL FEEDS CONTAINING THE SAME

Jason C. H. Shih, and C. Michael Williams, both of Cary, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Mar. 31, 1988, Ser. No. 176,069

Int. Cl.[4] A23K *1/10*

U.S. Cl. 426—61 7 Claims

1. A hydrolyzed feather animal feed supplement consisting essentially of partially hydrolyzed feather, proteins cleaved from said partially hydrolyzed feather, peptides cleaved from said partially hydrolyzed feather, and *Bacillus licheniformis* PWD-1 (ATCC No. 53757) cells, said feather hydrolyzed to an extent sufficient to increase the digestability thereof.

4,908,221

IRRADIATOR AND METHOD OF USING IRRADIATOR TO IRRADIATE

Lawrence G. Barrett, 3223 Downing Dr., Lynchburg, Va. 24503

Division of Ser. No. 819,254, Jan. 16, 1986, Pat. No. 4,760,264. This application Apr. 22, 1988, Ser. No. 184,878

Int. Cl.[4] A23L *3/26*

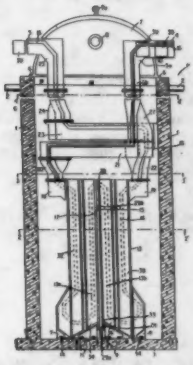
U.S. Cl. 426—240 12 Claims

1. A method of irradiating food products in a packing house irradiator with controlled dosages of radiation, said method comprising:

(a) conveying said food products into an enclosure;

(b) conveying said food products through a watertight duct, along a tortuous path, to an irradiation chamber located under water and within said enclosure;

(c) conveying said food products at least two times past a source of radiation located within said irradiation chamber to expose said food products to direct radiation from said source; and



(d) conveying said food products from said chamber to the exterior of said enclosure within said duct.

4,908,222

MICROWAVE BREWING APPARATUS AND METHOD

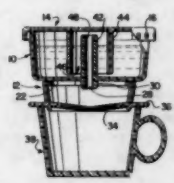
Dong Yu, 90 Hewitt Crescent, Ajax, Ontario, Canada L1S 7B3

Filed Mar. 14, 1989, Ser. No. 322,980

Claims priority, application Canada, Feb. 16, 1989, 591303

Int. Cl.[4] A23F *5/26;* H05B *6/80*

U.S. Cl. 426—241 10 Claims



1. A method of making a beverage from an infusible material in a microwave oven, which employs an apparatus having a microwave transparent pressurizable liquid reservoir disposed above a microwave transparent filter chamber adapted to hold a quantity of the infusible material, the reservoir and the filter chamber adapted to be placed over a beverage receptacle, the liquid reservoir being in fluid communication with the filter chamber through a pressure overflow means, the method comprising:

pouring a liquid into the liquid reservoir to a level not exceeding the overflow level of the overflow means,

placing a supply of an infusible material in the filter chamber,

pouring a liquid into the beverage receptacle,

closing said reservoir, positioning it over said filter chamber and placing the reservoir and the chamber over the receptacle,

heating said liquid in said reservoir and in said receptacle with microwave energy to raise the liquid vapor pressure in the reservoir sufficiently to force said liquid from the reservoir through the pressure overflow means into the filter chamber to make a beverage, and to raise vapors

from the liquid in the receptacle to contact the infusible material in the filter chamber, and

collecting the beverage in said receptacle.

4,908,223

OAT OR RICE BASED FROZEN DESSERT AND METHOD FOR PREPARATION

Pamela H. Murtaugh, and Timothy J. Murtaugh, both of 5025 Lake Mendota Dr., Madison, Wis. 53705

Filed Apr. 11, 1989, Ser. No. 336,048

Int. Cl.[4] A23G *9/02, 9/04*

U.S. Cl. 426—565 **21 Claims**

9. A method as claimed in claim **8**, wherein said solids are finely ground.

4,908,224

PROCESS FOR DEBITTERING SOYBEAN GRIT

Lois Yoder, 1121 Columbia Rd., NW., Washington, D.C. 20009

Continuation of Ser. No. 432,389, Sep. 30, 1982, abandoned. This application Nov. 17, 1986, Ser. No. 931,961

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—634 **13 Claims**

1. A method of debittering soybean grit to form a useable and edible, moist and fluffy soybean food product comprising the steps of: initially preheating a water bath consisting essentially of water to about boiling temperature; scalding and soaking a predetermined quantity of soybean grit by immersion in said water bath for a sufficient time interval to obtain absorption of approximately 25 to 50 percent of the water by the grit thereby initiating removal of bitter flavor constituents and causing swelling of the soybean grit without further heating of said water bath during said predetermined time interval after said initial preheating occurs; thoroughly straining the grit from the soak water and rinsing the wet grit with fresh water; rapidly heating the wet grit in a second water bath consisting essentially of water at temperatures at least equal to boiling temperature for a sufficient time period to substantially entirely remove bitter flavor constituents from the grit; and then removing the grit from the second water bath to rinse and drain the same.

4,908,225

USE OF A RESIN POWDER COMPOSITION FOR ELECTROSTATIC COATING

Isao Niimura, Tokyo; Hideo Nagasaka; Manabu Takeuchi, both of Hitachi; Toshiyuki Nita, and Susumu Suzuka, both of Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 95,215, Sep. 11, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,537

Claims priority, application Japan, Sep. 18, 1986, 61-217894

Int. Cl.[4] B05D *3/00*; C08K *3/10*

U.S. Cl. 427—25 **5 Claims**

1. In method for electrostatic coating, which comprises electrostatically coating a surface with a resin powder composition, wherein said composition comprises a thermosetting or thermoplastic resin the improvement comprising incorporating into said resin, an electric charge-increasing agent selected from the group consisting of a phthalocyanine compound, an anthraquinone compound, a metal compound of an organic carboxylic acid and an alkyl onium salt.

4,908,226

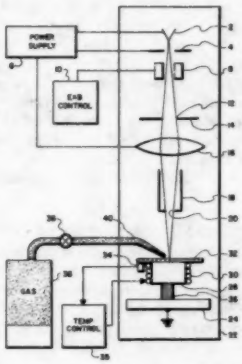
SELECTIVE AREA NUCLEATION AND GROWTH METHOD FOR METAL CHEMICAL VAPOR DEPOSITION USING FOCUSED ION BEAMS

Randall L. Kubena, Canoga Park, Calif., and Thomas M. Mayer, Chapel Hill, N.C., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 23, 1988, Ser. No. 197,734

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **44 Claims**



14. A method of depositing a material along a desired locus on a substrate, comprising:

exposing the substrate to a gas to form an adlayer of said gas on the substrate,

scanning said adlayer along said locus with a focused ion beam (FIB) at an ion dosage on the order of about 10^{12}–10^{16} ions cm^2 to form nucleation sites in said adlayer upon the substrate along said locus,

terminating said FIB scanning,

heating said substrate, and

exposing the heated substrate to a source gas which contains said material after the termination of said FIB scanning,

said substrate being heated during source gas exposure to a temperature high enough for said material to grow upon said nucleation sites from said source gas and form a substantially continuous deposit along said locus, but below the source gas' spontaneous thermal decomposition temperature for the period of time said substrate is heated and exposed to said source gas.

4,908,227

DIVINYL EPOXY ETHERS

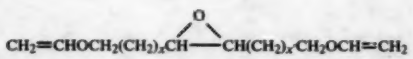
James A. Dougherty, Prospect Park; Fulvio J. Vara, Chester, and Lowell R. Anderson, Morristown, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Division of Ser. No. 109,389, Oct. 16, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,489

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—44 **9 Claims**

1. The process of formulating a coating containing a cross-linkable base resin, a cross-linking initiator and an effective cross-linking amount of an epoxy divinyl ether compound having the formula



$$CH_2{=}CHOCH_2(CH_2)_xCH\!-\!\underset{\diagdown\,O\,\diagup}{}\!CH(CH_2)_{x'}CH_2OCH{=}CH_2$$

wherein x and x' each independently have a value of from 0 to 3 and coating said formulation on a substrate.

4,908,228

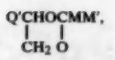
DIOXOLANE, DIOL AND DIACRYLATE SILICON COMPOUNDS AND METHOD FOR THEIR PREPARATION AND USE

Peter Y. K. Lo, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 914,899, Oct. 3, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 338,831
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 30 Claims

1. A method comprising mixing components comprising

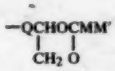
(i) an amount of a dioxolane compound having the formula



(ii) an amount of a silicon hydride compound containing at least one silicon-bonded hydrogen atom, the relative amounts of (i) and (ii) being sufficient to provide one site of aliphatic unsaturation for every silicon-bonded hydrogen atom to be reacted and

(iii) an amount of a hydrosilylation catalyst sufficient to accelerate a reaction between the silicon-bonded hydrogen atoms of the silicon hydride with the aliphatic unsaturation of the dioxolane compound;

and causing, by heating the mixture, or allowing a hydrosilylation reaction to occur between the dioxolane compound and the silicon hydride compound, thereby forming a dioxolane-substituted organosilicon compound containing at least one silicon-bonded dioxolane radical having the formula



where Q' is a monovalent, aliphatically unsaturated organic radical, M is a monovalent hydrocarbon radical free of aliphatic unsaturation containing from 1 to 6 carbon atoms, M' is H or M, and Q is a divalent organic radical which is bonded to a silicon atom by way of a silicon-carbon bond; all remaining silicon valences of the silicon hydride and of the dioxolane-substituted organosilicon compound being satisfied by radicals free of aliphatic unsaturation selected from the group consisting of monovalent hydrocarbon radicals, monovalent halohydrocarbon radicals, monovalent hydrolyzable radicals, hydrogen atoms, divalent radicals joining silicon atoms and mixtures thereof.

4,908,229

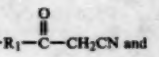
METHOD FOR PRODUCING AN ARTICLE CONTAINING A RADIATION CROSS-LINKED POLYMER AND THE ARTICLE PRODUCED THEREBY

Charles L. Kissel, Anaheim, Calif., assignor to Union Oil of California, Brea, Calif.

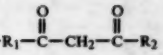
Continuation-in-part of Ser. No. 838,532, Mar. 11, 1986. This application Sep. 9, 1988, Ser. No. 243,056
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 52 Claims

1. A method of producing an article comprising the steps of:

(a) contacting a substrate with a polymer to form a substrate/polymer combination, the polymer comprising (i) at least about 10 weight percent olefinically unsaturated, carboxylic acid ester monomers, (ii) a backbone and (iii) a plurality of pendant functional groups, the pendant functional groups having the formula selected from the group consisting of



and



wherein

R_1 is a divalent radical; and

R_2 is selected from the group consisting of hydrogen and alkyl, arylalkyl, alkyloxy aryloxy, arylalkyloxy, alkenyl, alkenyloxy, alkynyl, alkynyloxy, and arylalkenyl radicals; and

(b) curing the polymer by exposing the substrate/polymer combination to radiation having a wavelength within the range of about 10^{-3} to about 400 nm.

4,908,230

PROCESS FOR COATING POLYCARBONATES WITH UV CURABLE COATINGS

Joseph E. Miller, Homewood, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 22, 1988, Ser. No. 289,655
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 7 Claims

1. A process for coating polycarbonate substrates with ultraviolet radiation (UV) curable coating compositions comprising:

(a) cooling said UV curable coating composition to a temperature below at least about 40° F. while maintaining the dew point of the surrounding atmosphere such that essentially no moisture condenses on said polycarbonate substrate;

(b) applying said cooled coating composition to the surface of said polycarbonate substrate; and

(c) subjecting said coated substrate to an amount of ultraviolet radiation sufficient to cure said coating.

4,908,231

AUTOMOBILE COATING HEAT TREATING PROCESS

James S. Nelson, Moundsview; Scott L. Angell, New Hope, and Jack E. Mannerud, Plymouth, all of Minn., assignors to BGK Finishing Systems, Inc., Plymouth, Minn.

Division of Ser. No. 905,289, Sep. 8, 1986, Pat. No. 4,771,728. This application Feb. 3, 1988, Ser. No. 151,912
Int. Cl.[4] B05D 3/06, 5/00
U.S. Cl. 427—55 15 Claims

1. A process for heat treating a coating applied to an automobile body with an apparatus having radiant heating means including a plurality of infrared heating lamps for generating radiant heat in a predetermined path and convection heating means for generating a flow of heated air in a predetermined path, said lamps divided into a plurality of separately controllable zones where an infrared intensity of lamps in one zone may be adjusted to be different from an intensity of lamps in a different zone, the process comprising the steps of:

(a) positioning an automobile body having an applied fresh coating in the path of said radiant heat;

(b) partially heat treating said coating by radiantly heating said coating with said radiant heat for a time sufficient for said coating to set;

(c) during said radiant heating, controlling an intensity of lamps within a zone to have an intensity selected in response to predetermined characteristics of said body exposed to said zone, and said radiant heating taking place in an absence of a flow of said heated air which would disturb said coating during said radiant heating;

(d) positioning said body within the path of said heated air; and

(e) subsequent to said radiant heating, containing heat treating said coating by convection heating said coating with said flow of heated air for a time sufficient to cure said coating.

4,908,232

METHOD AND APPARATUS FOR FORMING A THIN FILM ON AN OUTER SURFACE OF A DISPLAY SCREEN OF A CATHODE RAY TUBE

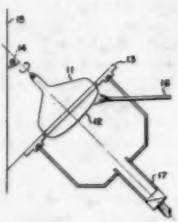
Takeo Itou, Fukaya; Hidemi Matsuda, Oomiya; Sakae Kamitani, Tatsuno, and Norihisa Takiura, Hyogo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 8, 1988, Ser. No. 179,326

Claims priority, application Japan, Apr. 10, 1987, 62-86966; Feb. 5, 1988, 63-23812

Int. Cl.[4] B05D 5/06

U.S. Cl. 427—72 17 Claims



1. A method of forming a thin film including SiO_2 on an outer surface of a display screen of a cathode ray tube, comprising the steps of:

applying a film formation material solution including a volatile solvent and silicon alcoholate on said outer surface of said display screen of said cathode ray tube to form a solution film on said outer surface;

rotating said cathode ray tube about a tube axis thereof to obtain a uniform film thickness of said solution film on the outer surface of said display screen; and

causing a portion of said solution film applied in and around the center of said outer surface of said display screen to dry, while said cathode ray tube is being rotated thereby producing SiO_2 from said silicon alcoholate in said film formation material solution to form the thin film including SiO_2 on said outer surface.

4,908,233

PRODUCTION OF MICROCAPSULES BY SIMPLE COACERVATION

Masahiro Takizawa, Saitama, and Hideyuki Takahashi, Chiba, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 859,590, May 5, 1986, Pat. No. 4,777,089. This application Apr. 13, 1988, Ser. No. 180,928

Claims priority, application Japan, May 8, 1985, 60-95978; May 8, 1985, 60-95980

Int. Cl.[4] A61K 7/46; A23L 1/221, 1/222; B01J 13/02

U.S. Cl. 427—213.35 3 Claims

1. A process for producing microcapsules according to a simple coacervation method by dispersing a capsule core material substantially insoluble in water in an aqueous solution containing a first water-soluble polymer selected from the group consisting of polyvinyl alcohol, sulfated cellulose, water-soluble nylon, gelatin, and poly(meth)acrylic acid and also adding inorganic or organic salt thereto, which comprises incorporating a second water-soluble polymer which undergoes substantially no phase separation with the above inorganic or organic salt together with the first water-soluble polymer in said aqueous solution, the concentration of the second water-soluble polymer in the aqueous solution being 0.1% to 10% by weight and the amount of the weight ratio of second water-soluble polymer added to the first water-soluble polymer in the aqueous solution is 0.05 to 5 parts by weight, per 1 part by weight of the first water-soluble polymer.

4,908,234

METHOD AND INSTALLATION FOR SPRAYING A MULTI-LAYER INSULATING REFRACTORY COATING, AND THE COATING THUS OBTAINED

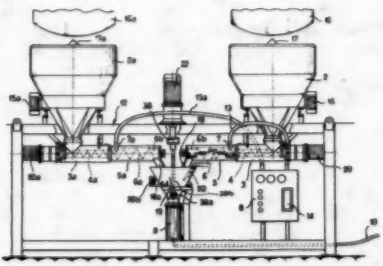
Jean-Charles Daussan, Metz; Gérard Daussan, and Andre Daussan, both of Longeville-Les-Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Filed Mar. 29, 1988, Ser. No. 174,908

Claims priority, application France, Apr. 3, 1987, 87 04694; Aug. 12, 1987, 87 11466

Int. Cl.[4] B05D 7/22; B05B 13/06

U.S. Cl. 427—236 25 Claims



1. In a method of applying an insulating refractory coating made up of at least two layers to interior surfaces of metallurgical vessels (1) in which at least two different aqueous pasty hardenable products each prepared by mixing with water a respective set of grainy, pulverulent or fibrous constituents or mixtures thereof are successively applied in successive layers to said surfaces; the improvement in which for each successive layer of different product, the respective aqueous pasty hardenable product is prepared as a ready-for-use mixture by mixing with water said respective set of grainy, pulverulent or fibrous constituents or mixtures thereof, then is pumped and supplied to a single means (11) for spraying onto the surface to be coated.

10. In an installation for applying an insulating refractory coating comprising at least two layers onto interior surfaces of metallurgical vessel (1), in which at least two different aqueous pasty hardenable products each prepared by mixing with water a respective set of grainy, pulverulent or fibrous constituents or mixtures thereof are successively applied in successive layers to said surfaces by the installation; the improvement in which the installation comprises first and second pairs of tubular members (3, 5; 3a, 5a) each containing a respective metering spiral conveyor (4, 4a) and a rotating mixing and conveying means, and means for supplying each pair of tubular members (3, 5; 3a, 5a) with the solid constituents of each layer to be formed, said second tubular members (5, 5a) each comprising a water inlet (7, 7a) connected to means (8) for continuously supplying the tubular members with a quantity of water neces-

sary to obtain a pasty consistency for each layer, and means for feeding a resulting aqueous pasty hardenable mixture coming from the two tubular members (3, 5) in the first pair or from the other two tubular members (3a, 5a) to a pump (9) connected to a single pipe system (10) for spraying the mixture.

4,908,235

PROCESS FOR THE PRODUCTION OF A BILAYER MEMBRANE

Cornelius A. Smolders, Hengelo; Antonius C. M. Franken, and Marcellinus H. V. Mulder, both of Enschede, all of Netherlands, assignors to Akzo NV, Netherlands

Filed Mar. 7, 1988, Ser. No. 164,911

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707054

Int. Cl.[4] B05D 5/00

U.S. Cl. 427—243 11 Claims

1. A process for the production of a bilayer membrane comprising a selectively acting nonporous polymer membrane first layer and a microporous membrane second layer comprising:

(i) contacting an excess amount of a polymer solution with one surface of said microporous membrane second layer, said polymer solution comprising at least one polymer and a solvent for said polymer,

(ii) volatilizing a portion of said solvent through the pores of said microporous layer as a vapor and without said polymer solution entering said pores, thereby forming said selectively acting non-porous polymer membrane layer on said surface of said microporous membrane second layer,

(iii) removing the excess polymer solution after the desired thickness of said selectively acting non-porous polymer membrane layer is achieved,

wherein said microporous membrane second layer has a maximum pore size, and said polymer solution has a viscosity, which permit volatization of said solvent through the pores of said microporous membrane second layer.

4,908,236

TRANSPARENT POROUS MEMBRANE HAVING HYDROPHILIC SURFACE AND PROCESS

Aldo M. Pitt, Sudbury, and Michael J. Steuck, N. Reading, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 937,755, Dec. 4, 1986. This application Dec. 19, 1988, Ser. No. 286,429

Int. Cl.[4] B01D 13/00

U.S. Cl. 427—245 32 Claims

17. The process for forming a composite hydrophilic porous membrane which is microscopically transparent in aqueous solution and which is formed from a porous polytetrafluoroethylene substrate having an average pore size between about 0.001 and 10 microns said substrate being directly coated over its entire surface with a crosslinked second polymer, said composite porous membrane having essentially the same porous configuration as said porous membrane substrate which comprises:

(a) washing said porous membrane substrate to wet the surfaces of the pores in said porous membrane; and

(b) contacting said porous membrane with a solution of a monomer of said second polymer, a cross-linking agent for said monomer and a polymerization initiator for said monomer under conditions to polymerize said monomer and to cross-link said second polymer over the entire surface of said porous polytetrafluoroethylene substrate, and to form a coating between about 10 and 200 Angstroms thick, said solution comprising between about 10 and 90 weight percent water and between about 10 and 80 weight percent of a water miscible organic solvent.

4,908,237

USE OF MODIFIED POLYETHYLENE FOR FINISHING GLASS SURFACES

Erich Ruf, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 81,479, Aug. 4, 1987, Pat. No.

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629167

Int. Cl.[4] B05D 3/12, 7/00; C08F 8/06

U.S. Cl. 427—314 4 Claims

1. An aqueous dispersion comprising water and an effective amount of a modified polyethylene of an average molecular weight of 500 to 10,000 and having at least one laterally bound group of the formula

$$-CONH(CH_2)_nNR^1R^2,$$

wherein R^1 and R^2 are the same or different and represent lower alkyl with 1 to 4 carbon atoms or its salts with aliphatic carboxylic acids of 1 to 3 carbon atoms, and n=2 or 3; said dispersion comprising in percent by weight:

Modified polyethylene	1–40
Dispersant	0.4–30
Water	98.6–30,

wherein the dispersant is selected from the group consisting of

(a) water soluble addition products of ethylene oxide on fatty acids,

(b) compounds having betaine as hydrophilic groups and long-chain alkyl groups as hydrophobic groups, and

(c) compounds which have amine oxide groups as hydrophilic groups and long-chain alkyl groups as hydrophobic groups.

2. A method of finishing the surface of a glass object, which comprises applying to the surface an effective amount of the dispersion of claim 1 and drying the surface.

4,908,238

TEMPERATURE ADAPTABLE TEXTILE FIBERS AND METHOD OF PREPARING SAME

Tyrone L. Vigo, New Orleans, La.; Cynthia M. Zimmerman, Douglasville, Ga.; Joseph S. Bruno, Chalmette, La., and Gary F. Danna, New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 55,476, May 29, 1987, Pat. No. 4,851,291, which is a continuation-in-part of Ser. No. 876,015, Jun. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 626,850, Jul. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 409,266, Aug. 18, 1982, abandoned. This application Jun. 27, 1989, Ser. No. 371,779

Int. Cl.[4] B05D 3/02

U.S. Cl. 427—389 12 Claims

1. A process for producing temperature adaptable non-hollow fibers which store heat when the temperature rises and release heat when the temperature decreases, wherein said fibers are selected from the group consisting of wood pulp, paper, cotton, rayon, wool, polyamide, polyester, polypropylene, acrylic, glass, and blends thereof, comprising

applying polyethylene glycol to said fibers in an amount of at least 0.15 grams polyethylene glycol per gram of fiber; and

thereafter heating said fibers at a temperature of about 100°–170° C. for a sufficient time to cross-link said polyethylene glycol on said fibers to such a degree that said polyethylene glycol becomes water insoluble but wherein said cross-linking is not so great as to inhibit the ability of said polyethylene glycol to change phases during subsequent raising or lowering of temperatures.

4,908,239

FINISHING OF LEATHER

Dietrich Lach, Friedelsheim; Guenter Eckert, Limburgerhof; Werner Maltry, Gorxheimertal, and Karl Fischer, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 261,928

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736475

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—389 **11 Claims**

1. A process for finishing leather by application of an aqueous mixture of at least one dispersed polymeric binder, casein and a crosslinking agent layer by layer, comprising:

applying an aqueous mixture comprising, based on the weight of solids, from 2 to 15% by weight of one or more polymeric binders, selected from the group of copolymers consisting of:

(A) 30 to 85% by weight of a C_2–C_6-alkyl ester of acrylic or methacrylic acid, 1 to 8% by weight of a carboxyl-containing monomer and 7 to 65% by weight of at least one comonomer selected from the group consisting of acrylonitrile, acrylamide, methacrylamide, vinyl chloride, vinyl acetate, and styrene,

(B) 50 to 90% by weight of vinylidene chloride, 10 to 50 % by weight of a C_2–C_4-alkylester of acrylic or methacrylic acid, 0 to 5% by weight of N-methylolacrylamide or N-methylolmethacrylamide, and 0% or 1 to 5% by weight of acrylamide or methacrylamide,

(C) 50 to 90% by weight of vinyl chloride, 10 to 50% by weight of a C_1–C_4-alkylester of acrylic or methacrylic acid, and 0 to 5% by weight of acrylamide or methacrylamide,

(D) 80 to 90% by weight of ethyl acrylate, and 10 to 20% by weight of acrylonitrile,

(E) 90 to 98% by weight of at least one C_1–C_4-alkylester of acrylic or methacrylic acid, and 2 to 10% by weight of acrylic or methacrylic acid or an amide thereof, and

(F) polyesterols of adipic acid and one or more aliphatic diols and polyurethanes prepared from aliphatic, cycloaliphatic, and aromatic diisocyanates and an aliphatic diol,

and mixtures thereof,

from 2 to 10% by weight of casein,

from 2 to 15% by weight of a crosslinking agent which is a condensation product of melamine, urea or mixtures thereof with formaldehyde, or further condensed with glyoxal, the methylol groups of this condensation product being wholly or partly etherified, or a condensation product of dicyandiamide or biuret with formaldehyde, or a condensation of dicyandiamine or biuret with formaldehyde further containing an aziridine compound as additional crosslinking agent,

ad 100% by weight of water,

in layers to leather from 2 to 6 times up to a total amount of from 10 to 100 g of solids/m^2 of leather surface area, drying after every application at from 20° to 80° C., and fixing from 1 to 3 times at from 150° to 220° C. in the course of a total contact time of from 0.1 to 5 seconds.

4,908,240

PRINTABILITY OF PAPER

Werner Auhorn, Frankenthal; Hans-Juergen Degen, Lorsch; Lothar Hoehr, Worms, and Ulrich Riebeling, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,679

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 3730887

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—391 **10 Claims**

1. A process for improving the printability of paper, wherein an aqueous coating agent consisting of

(a) 100 parts by weight of a finely divided pigment,

(b) from 5 to 70 parts by weight, based on polymer, of a cationic aqueous polymer dispersion of a paper size whose polymer has a glass transition temperature of from 5° to 80° C. and

(c) from 0.01 to 10 parts by weight of a surfactant which interferes with the formation of the surface size and/or of a polymeric dispersant

is applied in an amount of from 0.5 to 4 g/m^2 to one or both surfaces of the paper and the coated paper is dried.

4,908,241

PROCESS FOR THE CURRENTLESS DEPOSITION OF ELECTROPOSITIVE METAL LAYERS ON THE SURFACES OF LESS ELECTROPOSITIVE METALS

Helmut Quast, Würzburg, Fed. Rep. of Germany; Johannes Raber; Walter Ott, both of Graz, Austria; Hans-Georg von Schnering, Aidlingen, and Karl Peters, Leonberg, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Continuation of Ser. No. 446,075, Dec. 1, 1982, abandoned. This application Jul. 21, 1988, Ser. No. 222,386

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148330

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—437 **15 Claims**

1. Process for the currentless deposition of silver or gold on to appropriate less electropositive metals by contacting an object to be coated with a coating bath which contains a metal complex obtained by reacting silver or gold chloride with a base which is capable of complex formation with silver or gold, and hydrochloric acid, the mole ratio of base/silver or gold chloride/hydrochloric acid being (1 to 80)/1/(1 to 2), said object being contacted with said coating bath/or a time sufficient to produce a layer of silver or gold having a thickness of from 0.01 to 4 μm.

4,908,242

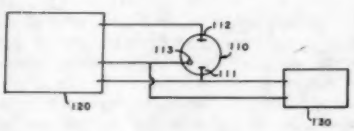
METHOD OF CONSISTENTLY PRODUCING A COPPER DEPOSIT ON A SUBSTRATE BY ELECTROLESS DEPOSITION WHICH DEPOSIT IS ESSENTIALLY FREE OF FISSURES

Rowan Hughes, Bedford, Ohio; Milan Paunovic, Port Washington, and Rudolph J. Zeblisky, Hauppauge, both of N.Y., assignors to Kollmorgen Corporation, Simsbury, Conn.

Continuation-in-part of Ser. No. 926,363, Oct. 31, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 187,821

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—443.1 **42 Claims**



1. In a method of depositing copper on a substrate with an electroless copper deposition solution including copper ions and a reducing agent for the copper ions, the improvement for producing a copper deposit which is essentially free of fissures comprising:

a. establishing an electroless copper deposition solution comprising said copper ions and said reducing agent and operating the solution by adjusting the concentrations of anodic and cathodic reagents such that the ratio of its intrinsic anodic reaction rate to its intrinsic cathodic reaction rate is less than about 1.1;

b. depositing copper with said electroless deposition solution on said substrate at said rate ratio; and

c. controlling the operation of said deposition solution such

that said ratio is substantially maintained throughout said copper deposition.

4,908,243

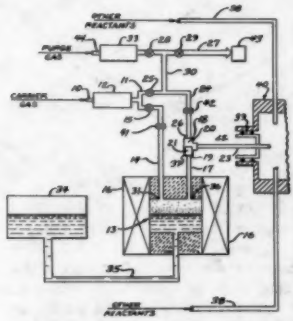
APPARATUS TO PROVIDE A VAPORIZED REACTANT FOR CHEMICAL-VAPOR DEPOSITION

Theron V. Page, Jr., Lake Oswego; Thomas F. Boydston, Tualatine, and John G. Posa, Tigard, all of Oreg., assignors to Akzo America Inc., New York, N.Y.

Division of Ser. No. 164,677, Mar. 7, 1988, Pat. No. 4,844,006. This application Apr. 17, 1989, Ser. No. 338,921

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—445 **10 Claims**



1. A process for alternately providing either carrier gas commingled with vaporized reactant for chemical-vapor deposition or carrier gas alone, said process utilizing a header valve means and a check valve means to enable switching between delivery of carrier gas commingled with vaporized reactant and delivery of carrier gas alone, said process comprising:

(a) heating a reactant in a reactant reservoir to vaporize at least a portion of said reactant in said reservoir.

(b) adjusting said header valve means to enable the introduction of carrier gas into said reactant reservoir gas with said vaporized reactant;

(c) passing at least a portion of said commingled carrier gas and vaporized reactant from said reactant reservoir in a first direction through a check valve means which permits flow therethrough in said first direction but not opposite thereto, and to a chemical-vapor deposition vessel; and

(d) adjusting said header valve means to discontinue introduction of carrier gas into said reactant reservoir and to institute the introduction of carrier gas into said chemical-vapor deposition vessel by passing said carrier gas in a second direction through said check valve means which permits the passage of said carrier gas in said second direction and into said chemical-vapor deposition vessel but which blocks passage of said carrier gas into said reactant reservoir.

4,908,244

ORNAMENTAL HOLIDAY DECORATION

Rose S. Bullock, Rochester, Mich., assignor to Charles B. Bullock, Bloomfield Hills, Mich.

Filed Mar. 13, 1989, Ser. No. 322,629

Int. Cl.[4] A47G *33/06*

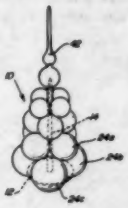
U.S. Cl. 428—8 **14 Claims**

1. An ornamental device comprising:

a base;

a shaft having a lower end removably connected to the base and an upper end; and

a plurality of decorative elements each having a loop extending therefrom, the elements being successively threaded onto the shaft such that the loop slidably holds the elements onto the shaft, the elements being arranged in a plurality of stacked layers, a lowermost layer having



elements of a given cross-sectional dimension while elements of upper layers are of different cross-sectional dimensions to thereby simulate a given shape.

4,908,245

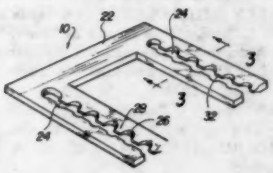
SELF RETAINING INJECTION MOLDED SHIMS

Burt Shah, 313 Ely Dr., Northville, Mich. 48167, and Sam Shah, Detroit, Mich., assignors to Burt Shah, Plymouth, Mich.

Filed Jul. 5, 1988, Ser. No. 215,342

Int. Cl.[4] F16B *2/00*

U.S. Cl. 428—33 **9 Claims**



1. A structural plastic shim for mounting in the space between a pair of closely spaced surfaces, one of which has a shaped projection protruding outwardly therefrom and the other of which has an opening therein for receiving said projection when said surfaces are mated, said shim comprising:

a generally plate shaped body positioned adjacent said one surface and having an aperture therethrough, said aperture being of a size to receive said projection therethrough, and a deflectable tab integral with said body and extending from said body into said aperture, said tab being engageable with said projection when the projection is extended through said aperture so as to retain said shim body on said projection as said surfaces are mated.

4,908,246

METALIZED MICROWAVE INTERACTIVE LAMINATE AND PROCESS FOR MECHANICALLY DEACTIVATING A SELECTED AREA OF MICROWAVE INTERACTIVE LAMINATE

Richard E. Fredricks, and Michael A. Schmelzer, both of Appleton, Wis., assignors to James River Corporation, Richmond, Va.

Filed Jan. 26, 1988, Ser. No. 148,483

Int. Cl.[4] B65D *1/00*; B32B *15/04*

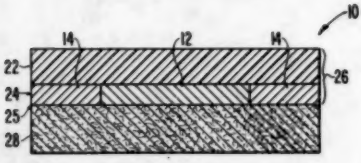
U.S. Cl. 428—34.1 **8 Claims**

1. A container for storing, supporting and microwave cooking food, comprising:

(a) a package having a surface or surfaces for enclosing and/or supporting a food product; and

(b) a microwave interactive laminate forming said surface or surfaces to heat said food product in response to microwave energy including:

(i) a microwave interactive film having a film layer and a microwave interactive layer disposed on one side of said film layer, said microwave interactive layer having a heating area and a deactivated area, said deactivated area having discontinuities produced by abrasion, whereby the capability of said deactivated area to generate heat in response to microwave energy has been reduced; and



(ii) a substrate layer bonded to said microwave interactive film to form a microwave interactive laminate, wherein said microwave interactive layer is disposed between said film layer and said substrate layer.

4,908,247

ARTICLE INCLUDING SEGMENT WHICH IS ELASTICALLY SHIRRABLE AFTER MANUFACTURE

James C. Baird, Cincinnati; Thurman J. Koger, II, Hamilton; Delmar R. Muckenfuhs, Middletown, and Milton D. Spahni, Okeana, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 852,053, Apr. 15, 1986, abandoned. This application Apr. 10, 1987, Ser. No. 36,941

Int. Cl.[4] A41B *9/14, 13/02;* **A41F** *9/02, 13/16;* **B32B** *31/16*

U.S. Cl. 428—34.9 **71 Claims**

1. An unrestrained article including at least one segment which is capable of being elastically shirred subsequent to the manufacture of said article along at least a portion of its length by mechanical manipulation of a predetermined portion thereof, said predetermined mechanically manipulatable portion of said shirrable segment comprising an elastomeric member which prior to mechanical manipulation is maintained in a prestretched and tensioned condition in the desired direction of shirring, the opposed ends of said shirrable segment in said article being interconnected to one another through said prestretched and tensioned elastomeric member, said prestretched and tensioned elastomeric member being secured in fixed relation to at least one rigidifying member to form a composite structure which is strong enough to resist collapse in a direction parallel to the tensile forces acting upon said prestretched and tensioned elastomeric member prior to mechanical manipulation of said predetermined portion of said shirrable segment of said article, said segment of said article being elastically shirrable by mechanically manipulating said predetermined portion of said shirrable segment until movement of said prestretched and tensioned elastomeric member and said rigidifying member relative to one another is effected in the area comprising said composite structure, said relative movement between said prestretched and tensioned elastomeric member and said rigidifying member being sufficient to release the tensile forces in the mechanically manipulated portion of said composite structure, whereby a degree of shirring of said segment will occur in the direction of prestretching of said elastomeric member, said degree of segment shirring being proportional to the extent to which there is relative movement between said prestretched and tensioned elastomeric member and said rigidifying member in the area comprising said composite structure.

4,908,248

COOLING DEVICE FOR COOLING PARTS IN THE PROXIMITY THEREOF

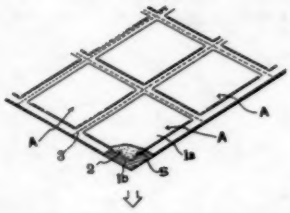
Mitsuyoshi Nakashima, 11-11, Nagazumi 5-chome, Minami-ku, Fukuoka-shi, Japan, and Satoshi Tsurusaki, 22-105, Natadanchi, Higashi-ku, Fukuoka-shi, Japan

Filed Jul. 25, 1988, Ser. No. 223,492

Claims priority, application Japan, May 19, 1988, 63-66680[U]

Int. Cl.[4] F25D *3/08*

U.S. Cl. 428—355 **3 Claims**



1. A cooling device for cooling an object or body part in proximity thereto, said cooling device including a cooling bag comprising

a pouch constituted of a pair of opposed walls, one of said walls being made of water impermeable sheet and the other of said walls being made of water permeable sheet capable of infiltrating water into said pouch by merely immersing said pouch in water, said opposed walls having the entire peripheries thereof completely bonded together to form a space between said opposed walls, and

a filling of hygroscopically swellable material in a powder form in said space of said pouch, said material being capable of swelling by absorbing water which is infiltrated into said space of said pouch through said wall made of water permeable sheet by merely immersing said pouch in water.

4,908,249

MARKERS FOR HYDRANTS AND OTHER UNDERGROUND UTILITIES FIXTURES

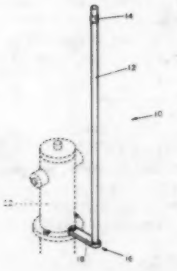
Kerry S. Lines, Winnipeg, Canada, assignor to C.K.T. Investments Limited, Winnipeg, Canada

Filed Oct. 24, 1988, Ser. No. 261,274

Claims priority, application Canada, Dec. 9, 1987, 553947

Int. Cl.[4] E01F *9/02*

U.S. Cl. 428—36.9 **14 Claims**



1. A marker for an underground utilities fixture comprising an elongated tube of resilient plastics material and mounting means for mounting the tube on the fixture, the mounting means comprising a bracket adapted to be bolted to the fixture

and a stud secured to the bracket and engaging an end of the tube.

4,908,250

OPTICAL RECORDING MEDIUM AND PRODUCTION METHOD THEREOF

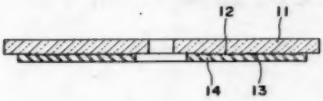
Akira Gotoh, Toride; Yukinobu Yamazaki, Ibaragi; Naoyuki Kikuchi, Toride; Shinkichi Horigome, Tachikawa; Motoyasu Terao, Tokyo; Hiroyuki Suzuki, Ibaragi; Makoto Kitoh; Yuichi Kokaku, both of Yokohama, and Mitsuru Shimizu, Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka and Hitachi, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 939,719, Dec. 9, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,925

Claims priority, application Japan, Dec. 9, 1985, 60-275112; Feb. 19, 1986, 61-32977; Mar. 19, 1986, 61-59434; Mar. 19, 1986, 61-59437

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—64 **8 Claims**



1. An optical recording medium consisting essentially of:

a disc substrate having an uneven grooved pattern preformed on one surface thereof;

an under layer formed on said uneven pattern of said disc substrate having a thickness of from 100 to 800 Å, said under layer consisting essentially of a high polymeric material having a first temperature at which said high polymeric material can be melted, sublimated, or decomposed, a heat resistance superior to said disc substrate and a lower heat conductivity than said substrate; and

a recording layer provided on said under layer, consisting essentially of a recording material having a second temperature at which said recording material can be melted, sublimated or decomposed;

said first temperature being lower than said second temperature;

said under layer being provided for relaxing thermal shock transmitted from said recording layer to said disc substrate.

4,908,251

POROUS REINFORCEMENT SHEET

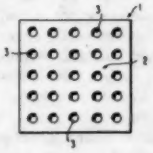
Mituo Iimura; Masatoshi Heguri; Satoru Gunji, and Kenji Ikehara, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Sep. 1, 1987, Ser. No. 91,914

Claims priority, application Japan, Sep. 1, 1986, 61-205496

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—68 **16 Claims**



1. A porous reinforcement sheet which is permeable to gases and liquids, comprising:

(a) a laminated sheet comprising a plastic porous sheet comprising a thermoplastic resin, and a hot melt type porous sheet having a thickness of about 5 to 500 μm, comprising a hot melt polymer having a melting point at least 5° C. lower than that of the thermoplastic resin, said plastic porous sheet having numerous cracks of about 10 to 2,500 μm in length; and

(b) a porous substrate which is permeable to gases and liquids and is directly adhered to the hot melt type porous sheet by the hot melt polymer.

4,908,252

PLEASANT-FEELING FRAGRANCE SAMPLER CONTAINING MICROCAPSULES

David W. Carnahan, Cartersville, Ga., and Edward I. Rabin, Westport, Conn., assignors to Arcade, Inc., Chattanooga, Tenn.

Filed Oct. 26, 1988, Ser. No. 263,506

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—27 **15 Claims**

1. A product dispenser comprising a sheet of fabric material presenting a resilient, compressible surface that is pleasant to the human touch and having rupturable uncoated microcapsules containing a product for application to the human skin embedded therein.

4,908,253

HIGH STRENGTH LAMINATE WITH BARRIER LAYER

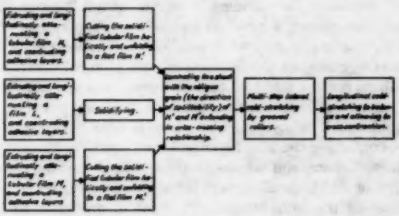
Ole-Bendt Rasmussen, Forchwaldstrasse 23, CH-6318 Walchwil/Zug, Switzerland

Continuation of Ser. No. 224,707, Jul. 27, 1988, abandoned, which is a continuation of Ser. No. 627,501, Jul. 9, 1984, Pat. No. 4,793,885, which is a continuation of Ser. No. 455,045, Jan. 3, 1983, abandoned, which is a continuation of Ser. No. 600, Jan. 2, 1979, abandoned, which is a continuation of Ser. No. 803,895, Jun. 6, 1977, abandoned, which is a division of Ser. No. 592,273, Jul. 1, 1975, Pat. No. 4,039,364. This application May 11, 1989, Ser. No. 351,298

Claims priority, application United Kingdom, Dec. 11, 1974, 53644; Feb. 12, 1975, 5972

Int. Cl.[4] B32B *3/28*

U.S. Cl. 428—114 **2 Claims**



1. A high-strength generally continous flexible laminate comprised of at least two generally continuous films each being biaxially oriented and generally weakly adhered to at least one other such film in sandwich relation, each such biaxi-

ally oriented film being formed by extrusion with coincidental melt attentuation of a blend of at least two polymers which are sufficiently incompatible as to exhibit upon said extrusion an internal microscopic fibrillar morphology in which elongated fibrils are arranged in a generalized grain-like pattern having one predominant grain direction and imparting a corresponding direction of splitability to such film, each such biaxially oriented film having incorporated within said generalized grain pattern a substantially zig-zagging specific grain configuration formed by fibrils exhibiting microscopically visible recurrent deflections generally laterally from said predominant grain direction at intervals therealong, such biaxially oriented films being arranged in the laminate in such manner that the respective directions of splitability for at least two such films intersect each other, said laminate including at least one added layer exhibiting barrier properties.

4,908,254

REMOVABLE OR HINGED COMPONENT FOR COVERING OPENINGS IN THE FUSELAGE OF AN AIRCRAFT

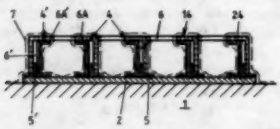
Josef Fischer, Ried im Innkreis, and Walter A. Stephan, Braunau, both of Austria, assignors to Fischer Gesellschaft m.b.H., Reid im Innkreis, Austria

Filed Mar. 10, 1988, Ser. No. 166,269

Claims priority, application Austria, Mar. 10, 1987, 561/87; Feb. 19, 1988, 398/88

Int. Cl.[4] B32B *7/00*; B64C *1/00*

U.S. Cl. 428—119 **7 Claims**



1. Component for cladding apertures in the fuselage of an aircraft comprising a panel-like base layer, a plurality of U-profiles and a plurality of L-profiles each having only two limbs at right angles to one another, said U-profiles each having a base portion and two limbs situated opposite each other and extending from opposite ends of the base portion, said U-profiles each being applied to said base layer with one of said limbs contacting the base layer and the U-profiles being parallel to each other, and wherein on one side of the base portion of each of said U-profiles, which one side is opposite to a side from which the limbs extend, one of said L-profiles is located, one limb of the L-profile being applied to the base layer and parallel to the U-profiles, and the other limb of the L-profile being applied to the base portion of the respective U-profile, the limbs of the U-profiles which are at respective ends of the base layer pointing towards one another.

4,908,255

SEPARATE PLATE AND PROCESS FOR PRODUCING THE SAME

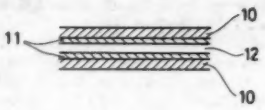
Kazunori Ishikawa; Takuji Taniguchi; Kazumasa Tsukamoto, all of Anjo, and Shiro Goto, Shinshiro, all of Japan, assignors to Aisin AW Co., Ltd., Aichi, Japan

Filed Sep. 12, 1988, Ser. No. 243,002

Claims priority, application Japan, Sep. 14, 1987, 62-231455

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—131 **5 Claims**



4. A separate plate according to claim **1**, wherein said gasket sheets are made of a material selected from the group consisting of organic fibers, inorganic fibers and mixtures thereof.

4,908,256

CERAMIC-METAL COMPOSITE BODIES

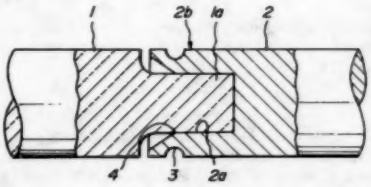
Isao Oda, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 27, 1987, Ser. No. 54,810

Claims priority, application Japan, Jun. 9, 1986, 61-131919

Int. Cl.[4] B32B *3/16*

U.S. Cl. 428—133 **10 Claims**



1. A ceramic-metal composite body comprising:

a ceramic member including a ceramic projection formed thereon;

a metallic member including a recess or through hole formed in one end thereof, said ceramic member and said metallic member being joined together only at a single, continuous contact surface between said members, said ceramic protrusion being fitted into said metallic recess or through hole, said contact surface having a fitting end defined by the beginning of said contact surface proximate said one end of said metallic member; and

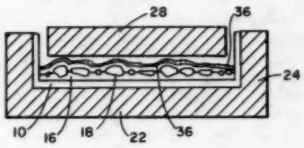
a circumferential groove in the outer periphery of said metallic member located substantially in a plane normal to the axis of said metallic member, and extending substantially completely around said metallic member, a center line of said groove and said fitting end being located substantially an equal distance from said one end of said metallic member.

4,908,257

SIMULATED STONE

David Baskin, Duxbury, Mass., assignor to Suncor Corporation, Newton, Mass.

Filed Jun. 8, 1987, Ser. No. 59,546
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—147 5 Claims



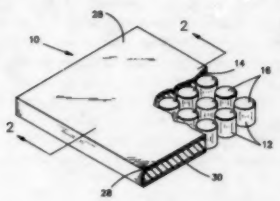
1. A cast simulated-stone containing thermally stable globules of overfilled, cured resin composition.

4,908,258

HIGH DIELECTRIC CONSTANT FLEXIBLE SHEET MATERIAL

Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Aug. 1, 1988, Ser. No. 226,619
Int. Cl.[4] B32B *27/14*
U.S. Cl. 428—198 13 Claims



1. A high dielectric constant flexible sheet comprising:
an array of spaced high dielectric chips arranged in a single layer, each of said chips having side, top and bottom surfaces;
a binder comprising a flexible thermoplastic polymer or a flexibilized thermoset polymer between said side surfaces of said chips and binding said chips to define a cohesive-sheet having opposed first and second planar surfaces with said top and bottom surfaces of said chips being exposed on said respective first and second surfaces;
a first metallized layer on said first planar surface; and
a second metallized layer on said second planar surface.

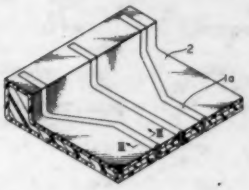
4,908,259

MOLDED ARTICLE WITH PARTIAL METAL PLATING AND A PROCESS FOR PRODUCING SUCH ARTICLE

Tetsuo Yumoto, Tokorozawa, Japan, assignor to Sankyo Kasei Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 109,353, Oct. 15, 1987, Pat. No. 4,812,275. This application Apr. 13, 1988, Ser. No. 180,923
Claims priority, application Japan, Nov. 18, 1986, 61-273035
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—209 7 Claims

1. A partially metal-plated molded product comprising a plastic primary molded article having an outer surface, protrusions extending from said outer surface, said outer surface and said protrusions having a roughened etched surface formed by etching in an acid, a catalyst disposed on said roughened etched surface, a plastic secondary molded article disposed about said primary molded article, said secondary molded article having an external surface with through openings in which are disposed said protrusions of said primary molded



article, said protrusions having exposed external faces, and plated metal on said external faces of said protrusions.

4,908,260

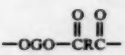
FLAME-RETARDANT, VAPOR-PERMEABLE WATERPROOF STRUCTURE

Harshad R. Dodia, Kennett Square, Pa., and George J. Ostapchenko, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 7, 1988, Ser. No. 241,365
Int. Cl.[4] B32B *5/24, 5/32, 27/18, 27/36*
U.S. Cl. 428—215 22 Claims

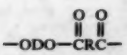
1. A flame resistant copolyetherester elastomer film composition comprising

(a) 60–85 weight percent of a hydrophilic copolyetherester elastomer film having a thickness of 0.3–1.6 mils, a water vapor transmission rate of at least 6,000 gm.mil/m^2/24 hours and an elongation of at least 600% with said hydrophilic elastomer film consisting essentially of a multiplicity of long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula



—OGO—CRC—

and said short chain ester units represented by the formula



—ODO—CRC—

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide)-glycol having an average molecular weight of about 400–3500 and, further, the poly(alkylene oxide)glycol contains sufficient units of ethylene oxide to incorporate in the resulting copolyetherester from about 25–68 weight percent units of ethylene oxide based on the total weight of the copolyetherester elastomer; R is a divalent radical remaining after the removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than 300; D is a divalent radical remaining after the removal of hydroxyl groups from a diol having a molecular weight less than 250; the copolyetherester elastomer contains about 25–80 weight percent short chain ester units, and

(b) 15–40 weight percent of a flame retardant component comprised of 37.5 to 100 weight percent of a brominated aromatic compound selected from the group consisting of tetradecabromodiphenoxybenzene, ethylenebistetrabromophthalimide, and decabromodiphenoxybenzene, wherein the weight percents for component (a) and component (b) are based upon the weight of (a) and (b) only and provided that the ratio of the film thickness, in mils, to the weight percent of the brominated aromatic com-

pound, as based upon the weight of (a) and (b), is less than about 0.04.

4,908,261

NON-FERROUS METAL MECHANICAL PART

Takashi Ishii, Tokyo; Hisao Yabe, Fujisawa, and Hajime Kohama, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 31,262, Mar. 30, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 252,001

Claims priority, application Japan, Mar. 31, 1986, 61-72838; Mar. 31, 1986, 61-72839

Int. Cl.[4] B32B *9/00*; **C23F** *7/26*; **C23C** *1/12*

U.S. Cl. 428—216 **11 Claims**

1. A non-ferrous metal mechanical part having a wear-resistant surface comprising:

(a) a substrate of a metal selected from the group consisting of aluminum, aluminum alloy, nickel and nickel alloy;

(b) a substantially non-porous surface layer formed on a surface of said substrate, said surface layer substantially containing chromium oxide, said chromium oxide being converted from a chromium compound capable of forming the same upon heating thereof; and

(c) an intermediate layer including a reaction product between the chromium oxide in said surface layer and said substrate, being formed at an interface between said surface layer and said substrate;

which mechanical part is produced by a process which comprises:

(1) applying an aqueous solution of a chromium compound capable of forming chromium oxide upon heating to the surface of a substrate of a metal selected from the group consisting of aluminum, aluminum alloy, nickel and nickel alloy, to form a coated substrate; and

(2) heating said coated substrate to a temperature of about 450° to 600° C., thereby converting said chromium compound in said applied aqueous solution to chromium oxide, to form a dense, hard wear-resistant ceramic layer on said substrate.

4,908,262

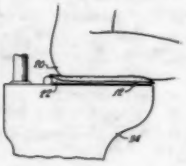
ARTICLE WITH MICROBIOCIDAL SOLUTION

Eric L. Nelson, Newport Beach, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Division of Ser. No. 42,712, Apr. 27, 1987, Pat. No. 4,745,640. This application Feb. 3, 1988, Ser. No. 152,031

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—283 **19 Claims**



1. As an article of manufacture, a sheet configured to cover a toilet seat comprising:

(a) microencapsulated particles of a water-soluble copper salt or compound uniformly dispersed in said sheet; and

(b) microencapsulated particles of a water-soluble ene-diol compound uniformly dispersed in said sheet, said particles of water-soluble copper salt or compound and ene-diol compound being present in an amount sufficient to, when contacted with perspiration, provide a microbiocidal solution of copper ions and said ene-diol compound in said perspiration and said sheet providing means for retaining said microbiocidal solution therein.

4,908,263

NONWOVEN THERMAL INSULATING STRETCH FABRIC

John F. Reed, Arden Hills; Daniel E. Meyer, Stillwater, and Thomas P. Hanschen, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1988, Ser. No. 193,779

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—286 **17 Claims**

1. A nonwoven thermal insulating stretch fabric comprising 10 to 90 weight percent elastomeric melt blown microfiber web, the microfibers having an average diameter of less than about 25 micrometers, and about 10 to 90 weight percent crimped bulking fibers, the microfibers being bonded to the bulking fibers at points of contact and the fabric having substantially uniform stretch properties such that the fabric will recover to within about 10 percent of the original dimensions within one hour after being elongated to 125 percent of the original length.

4,908,264

COMPOSITES COMPRISING AN ARAMID MATRIX

Doetze J. Sikkema, An Ellecom, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Sep. 16, 1988, Ser. No. 245,231

Claims priority, application Netherlands, Sep. 17, 1987, 8702221

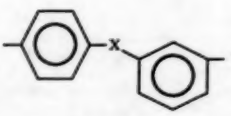
Int. Cl.[4] C08L *77/10*; **C08K** *7/04*

U.S. Cl. 428—294 **12 Claims**

1. A combination of 10–80% by volume of reinforcing fibres and 20–90% by volume of thermoplastic fibres or films suitable to be formed into a composite structure, the thermoplastic fibres or films essentially consisting of an amorphous copolyamide built up of units derived from at least two different dicarboxylic acids and at least two different diamines, of which the divalent aromatic radicals are linked together by amide bonds selected from the groups P1, P2, Q1 and Q2,

P1: 1,4-phenylene, 1,5-naphthylene, 2,6-naphthylene and 4,4'-diphenylene;

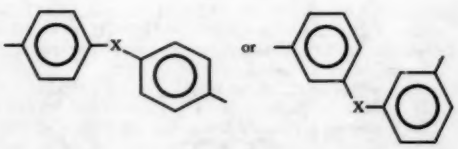
P2: radicals of the formula:



where X=—C(Y)(Y')—, —O—, —S—, —SO_2— or —CO—, and Y,Y' are the same or different and represent hydrogen or C_{1-4} alkyl, or together cyclohexyl;

Q1: 1,3-phenylene, 1,6-naphthylene, 2,7-naphthylene and 3,4'-diphenylene;

Q2: radicals of the formula:



where X=—C(Y)(Y')—, —O—, —S—, —SO_2— or —CO— and Y,Y' are the same or different and represent hydrogen or C_{1-4} alkyl, or together cyclohexyl;

each group including the radicals which per aromatic ring comprise 1–4 substituents R, where R may be the same or different and may stand for C_{1-4} alkyl, C_{1-4} alkoxy, Cl, F, aryl, ortho-fused benzeno or aryl-C_{1-4}-alkyl, with the proviso that

expressed as the mole fraction of the total of amide bonds the proportion of none of the monomer units is higher than 0.32, the proportion of radicals selected from the groups P1 and P2 together is in the range of 0.18 to 0.82, the proportion of the radicals selected from the groups Q1 and Q2 together is in the range of 0.18 to 0.82, and the proportion of the radicals from the group Q2 is at least 0.15.

4,908,265

ARTICLES OF MANUFACTURE AND THEIR PRODUCTION

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove Village, Ill.

Division of Ser. No. 261,124, Oct. 24, 1988, Pat. No. 4,874,452. This application Jul. 31, 1989, Ser. No. 387,011

Int. Cl.[4] B05D *3/02*

U.S. Cl. 428—318.4 **16 Claims**

1. A composite article produced by a process which comprises compressing and heat curing while interposed between a plurality of substrates a non-resilient, non-flexible recurable material formed by subjecting cured polyimide foam to the action of pressurized steam.

4,908,266

ULTRATHIN CELLULOSE ESTER POLYMER FILMS AND THEIR PREPARATION

Rachel S. Kohn, Springfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 917,982, Oct. 10, 1986, Pat. No. 4,746,475. This application Jan. 29, 1988, Ser. No. 150,174

Int. Cl.[4] B29C *4/12*

U.S. Cl. 428—333 **17 Claims**

1. An ultrathin cellulose ester free-standing film containing no holes more than about one micron in diameter and having a thickness of about 160 angstroms or less and randomly oriented molecules.

7. The film of claim 6 wherein the cellulose ester is cellulose acetate, cellulose triacetate, cellulose butyrate, cellulose propionate, cellulose acetate butyrate or cellulose acetate propionate.

4,908,267

ULTRATHIN POLYETHER SULFONE FILMS AND THEIR PREPARATION

Rachel S. Kohn, Springfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 918,284, Oct. 10, 1986, Pat. No. 4,776,999. This application Jan. 29, 1988, Ser. No. 150,173

Int. Cl.[4] B29C *41/12*

U.S. Cl. 428—333 **17 Claims**

1. A polyether sulfone free-standing polymer film containing no macroscopic holes and having a thickness of about 180 angstroms or less and randomly oriented molecules.

8. A polyether sulfone film containing no macroscopic holes and having a thickness of about 400 angstroms or less and randomly oriented molecules prepared according to the process comprising:

(a) preparing a casting solution containing a polyether sulfone polymer at about the two to about the twelve percent by weight level, based on the total weight of the casting solution, in 1,2,3-trichloropropane or 1,1,2,2-tetrachloroethane;

(b) depositing the casting solution on water to form a free-standing film; and

(c) removing the film from the water.

4,908,268

ETHYLENE VINYL ACETATE-DIOCTYL MALEATE-2-ETHYLHEXYL ACRYLATE INTERPOLYMERS

Paul R. Mudge, Belle Mead, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 17, 1988, Ser. No. 169,632

Int. Cl.[4] C08F *20/10*; C09U *7/02*; C09J *7/02*

U.S. Cl. 428—343 **10 Claims**

1. Plasticized polyvinyl chloride substrates coated with a pressure sensitive adhesive composition comprising 25–40% by weight of a vinyl ester of a alkanoic acid; 10 to 30% by weight ethylene; 20 to 30% by weight of di-2-ethylhexyl maleate or fumarate; 20 to 30% by weight 2-ethylhexyl acrylate and 1 to 5% by weight of a mono-carboxylic acid; wherein the adhesive is prepared using semi-batch emulsion polymerization techniques and wherein 50 to 75% of the maleate or fumarate monomer is charged initally with all the ethylene and vinyl ester and wherein the remaining maleate or fumarate is added incrementally over the course of the polymerization with the acrylate and monocarboxylic acid monomers.

4,908,269

CRIMPED POLYESTER-YARN FROM COLD DRAWN POLYESTER-POY-YARN AND PROCESS FOR ITS MANUFACTURE

Hugo Specker, Sempach, and Paul Schaffner, Kriens, both of Switzerland, assignors to Viscosuisse S.A., Emmenbrucke, Switzerland

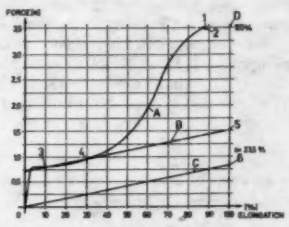
PCT No. PCT/CH83/00138, § 371 Date Aug. 9, 1984, § 102(e) Date Aug. 9, 1984, PCT Pub. No. WO84/02357, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 8, 1983, Ser. No. 642,919

Claims priority, application Switzerland, Dec. 17, 1982, 7354/82

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—369 **5 Claims**



1. Crimped polyester yarn obtained from cold drawn partially-oriented polyester yarn, said crimped polyester yarn having a secant modulus of 0–100% as determined by the stress versus strain curve for said crimped polyester yarn between 10% and 30% elongation.

4,908,270

CONTINUOUS PREPARATION OF NITROSYL FLUORIDE

Nickolas J. Stepaniuk, Chesterfield, and Bruce J. Lamb, St. Charles, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

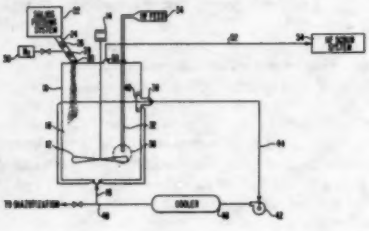
Filed Feb. 27, 1989, Ser. No. 316,024

Int. Cl.[4] C01B *21/084*

U.S. Cl. 423—386 **18 Claims**

1. A process for the preparation of nitrosyl fluoride, comprising separately introducing and blending nitrite and hydrogen fluoride into nitrosyl fluoride solution so as to form a reaction mixture within which the nitrite and the hydrogen fluoride react so as to produce additional nitrosyl fluoride, and

removing nitrosyl fluoride produced in the reaction mixture, wherein the reaction mixture is maintained at a substantially constant volume during the introducing and removing steps, and wherein said hydrogen fluoride is introduced into said reaction mixture spaced away from where said nitrite is introduced into said reaction mixture so that the hydrogen fluoride and the nitrite independently mix into said nitrosyl fluoride solution and are diluted therein before mixing with each other, thereby avoiding a violent reaction between the hydrogen fluoride and the nitrite.



4,908,271

CAPSULE-SHAPED POLYMER PARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Kiyoshi Kasai, Yokkaichi; Masayuki Hattori, Aichi; Hiromi Takeuchi, and Nobuo Sakurai, both of Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 871,416, May 23, 1986, Pat. No. 4,798,691. This application Jun. 28, 1988, Ser. No. 212,577

Claims priority, application Japan, Oct. 3, 1984, 59-206172

Int. Cl.[4] B32B *25/00, 27/00*

U.S. Cl. 428—402.22 **4 Claims**

1. A capsule-shaped polymer particle having a shell portion and a core portion, said shell portion comprising a copolymer prepared by radical copolymerization of vinyl monomers, said copolymer comprising 1–50 wt. % of a cross-linkable monomer, 3–99 wt. % of a hydrophilic monomer, and 0–85 wt. % of at least one monomer copolymerizable with said cross-linkable monomer of hydrophilic monomer, said core portion comprising an oily substance, water or mixtures thereof, and said polymer particle having an outer diameter of 0.2–0.6 micron and an inner diameter of $\frac{1}{4}$ to $\frac{3}{4}$ of the outer diameter.

4,908,272

GAS-BARRIER MULTILAYERED STRUCTURE

Masahiro Harada, Hiratsuka; Makoto Matsumura, Toyonaka; Toru Kino; Akira Iwamoto, both of Hiratsuka, and Yoshiaki Momose, Hadano, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 186,080

Claims priority, application Japan, Apr. 27, 1987, 62-102019; Apr. 27, 1987, 62-102020

Int. Cl.[4] B32B *27/34, 27/08, 27/28*

U.S. Cl. 428—412 **14 Claims**

1. A gas-barrier multilayered structure comprising

(A) at least one layer of a copolyamide which is substantially amorphous and has a glass transition temperature of 90° to 130° C. and is composed of

(a) a dicarboxylic acid component composed of from more than 55 to less than 70 mole % of an aliphatic dicarboxylic acid component and 45 to 30 mole % of an aromatic dicarboxylic acid component consisting substantially of 20 to 30 mole % of isophthalic acid and 5 to 20 mole % of terephthalic acid, and (b) a diamine component composed substantially of a m-xylylenediamine component, and

(B) at least one layer of a thermoplastic resin other than the copolyamide.

4,908,273

MULTI-LAYER, HEAT-CURABLE ADHESIVE FILM

Karl Urech, Prattein, and Roland Moser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1988, Ser. No. 167,764

Claims priority, application Switzerland, Mar. 24, 1987, 1118/87

Int. Cl.[4] B32B *27/06, 27/38*

U.S. Cl. 428—413 **10 Claims**

1. A multi-layer, heat-curable adhesive film having a tacky external curable layer A, containing

(a) 15 to 40% by weight of an adduct I containing epoxide groups and formed from an aromatic diglycidyl or polyglycidyl ether having an epoxide content of 3.5 to 6.5 equivalents/kg and a carboxyl-terminated butadiene/acrylonitrile rubber or a carboxyl-terminated polyester,

(b) 15 to 40% by weight of an adduct II containing epoxide groups and formed from an aromatic diglycidyl ether having an epoxide content of 0.3 to 3.0 equivalents/kg and a carboxyl-terminated butadiene/acrylonitrile rubber or a carboxyl-terminated polyester,

(c) 16 to 30% by weight of an aromatic diglycidyl or polyglycidyl ether having an epoxide content of 3.5 to 6.5 equivalents/kg,

(d) 0 to 6% by weight of an aromatic diglycidyl ether having an epoxide content of 0.3 to 3.0 equivalents/kg,

(e) 10 to 25% by weight of one or more customary fillers,

(f) 1 to 6% by weight of dicyandiamide,

(g) 0 to 2% by weight of a curing accelerator and,

(h) further customary additives, the components (a) to (h) adding up to 100% by weight,

a dry external curable layer B, containing

(a) 15 to 40% by weight of an adduct I containing epoxide groups,

(b) 15 to 40% by weight of an adduct II containing epoxide groups,

(c) 0 to 15% by weight of an aromatic diglycidyl or polyglycidyl ether having an epoxide content of 3.5 to 6.5 equivalents/kg,

(d) 0 to 6% by weight of an aromatic diglycidyl ether having an epoxide content of 0.3 to 3.0 equivalents/kg,

(e) 15 to 40% by weight of one or more customary fillers,

(f) 1 to 6% by weight of dicyandiamide,

(g) 0 to 2% by weight of a curing accelerator, and,

(h) further customary additives, the components (a) to (h) adding up to 100% by weight.

4,908,274

POLYSILOXANES WITH (METH) ACRYLATE ESTER GROUPS LINKED THROUGH SIC GROUPS AND THEIR USE AS RADIATION-CURABLE COATING MATERIALS FOR FLAT CARRIERS

Jürgen Jachmann, Herne; Christian Weitemeyer, Essen, and Dietmar Wewers, Bottrop, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG

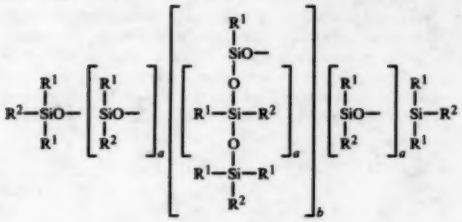
Filed Feb. 1, 1988, Ser. No. 150,773

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703648

Int. Cl.[4] B32B *9/06;* **C08G** *77/04*

U.S. Cl. 428—452 **16 Claims**

1. Polysiloxanes with (meth)acrylate ester groups linked over SiC groups, obtained by the reaction of epoxy-functional polysiloxanes of the general formula



in which

R^1 are the same or different low molecular weight alkyl groups with 1 to 4 carbon atoms or phenyl groups,

R^2 is the same as R^1 or represents the R^3 group, 70 to 100% of the R^3 groups being epoxy functional groups and 30 to 0% being alkyl groups with 2 to 20 carbon atoms or hydrogen, with the proviso that the average molecule contains at least 1.5 epoxy groups,

a has a value of 1 to 1,000 and

b a value of 0 to 10,

with such amounts of an acid mixture, consisting of

(a) 10 to 90 mole percent of (meth)acrylic anhydride, and

(b) 90 to 10 mole percent of (meth)acrylic acid

that the sum of (a) and (b) adds up to 100 mole percent, and that there are present 0.8 to 1.9 acid equivalents per epoxide equivalents.

4,908,275

FILM CARRIER AND METHOD OF MANUFACTURING SAME

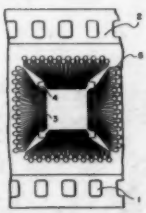
Masahiro Tsuji; Susumu Kawauchi, both of Kanagawa, and Hiroshi Nakayama, Tokyo, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,479

Claims priority, application Japan, Mar. 4, 1987, 62-47450; Jul. 7, 1987, 62-167896; Jul. 7, 1987, 62-167897

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—457 **9 Claims**



1. A film carrier comprising a resin base film and a rolled copper foil laminated thereon, said rolled copper foil forming leads for mounting semiconductor chips or other electronic components in place, characterized in that said rolled copper foil is made of a copper alloy composition consisting essentially of a total of 0.005 to 1.5% by weight of one or more selected from the group consisting of

P	0.005–0.05	wt %,	B	0.005–0.05	wt %,
Al	0.01–0.5	wt %,	As	0.01–0.5	wt %
Cd	0.01–0.5	wt %,	Co	0.01–0.5	wt %,
Fe	0.01–0.5	wt %,	In	0.01–0.5	wt %,
Mg	0.01 = 0.5	wt %,	Mn	0.05–0.2	wt %,
Ni	0.01–0.5	wt %,	Si	0.01–0.5	wt %,
Sn	0.01–0.5	wt %,	Te	0.01–0.5	wt %,
Ag	0.01–1	wt %,	Cr	0.01–1	wt %,

-continued

Hf	0.01–1	wt %,	Zn	0.01–1	wt % and
Zr	0.01–1	wt %,			

and the remainder Cu with inevitable impurities.

4,908,276

REFLECTING PLATE

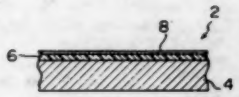
Kanjiro Yamamoto, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 16, 1985, Ser. No. 691,784

Claims priority, application Japan, Feb. 1, 1984, 59-15245

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—458 **19 Claims**



1. A reflecting plate for an illuminating lamp comprising

a substrate having a surface,

a thermosetting synthetic resin interlayer formed on the surface of the substrate, and

a thin metallic film formed on the surface of the thermosetting synthetic resin interlayer.

4,908,277

POLYESTER FILM

Kenji Tsunashima, Kyoto; Takashi Mimura, Ootsu; Takashi Sumiya, Ootsu, and Hiroshi Kuboyama, Ootsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 168,944

Claims priority, application Japan, Mar. 16, 1987, 62-59009; Aug. 18, 1987, 62-204809

Int. Cl.[4] B32B *27/08, 27/36*

U.S. Cl. 428—480 **16 Claims**

1. A composite polyester film comprising a polyester-based film and a surface layer laminated on at least one surface of the base film, the surface layer containing oriented styrenesulfonic acid groups and/or salts thereof with an orientation degree of 5–100.

4,908,278

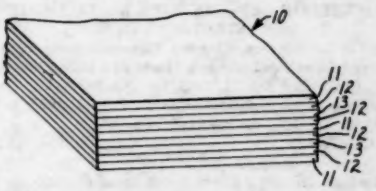
SEVERABLE MULTILAYER THERMOPLASTIC FILM

Ralph H. Bland, St. Paul; William A. Peper, Maplewood, and Bruce D. Stambaugh, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 31, 1986, Ser. No. 926,371

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—500 **45 Claims**



1. A thermoplastic, severable film having a plurality of randomly occurring parallel layers of a brittle thermoplastic

polymeric material having a glass transition temperature of greater than 50° C., and a ductile polymeric material having at least 100% elongation at break situated one on the other in an array, said array comprising the product of a steam of each of said materials which, independently, has been split into a predetermined number of substream and said substreams subsequently recombined to form said array,

wherein no two adjacent layers of said array are of the same material, and

wherein each of said layers has sufficient adhesion to said adjacent layers to enable said film to be severed precisely in a straight line.

4,908,279

MULTILAYER ELECTROPLATED STEEL SHEET

Hirose Yusuke, Minamikawachi; Uchida Yukio, Amagasaki; Kato Yoshio, Nishinomiya; Hisada Kazuyuki, Amagasaki; Watanabe Koichi, Amagasaki; Sakai Nobuhiko, Amagasaki, and Miyoshi Yasushi, Izumisano, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00378, § 371 Date Dec. 31, 1987, § 102(e) Date Dec. 31, 1987, PCT Pub. No. WO88/04335, PCT Pub. Date Jun. 16, 1988

PCT Filed Jun. 12, 1987, Ser. No. 144,925

Claims priority, application Japan, Dec. 6, 1986, 61-291374

Int. Cl.[4] B32B *15/18*

U.S. Cl. 428—659 **4 Claims**

1. A multilayer zinc metal electroplated steel sheet comprising (i) a lower layer electroplated coating provided on the surface of the steel sheet and comprising a Zn-Ni base alloy having Ni content of 10 to 16 wt.% or Zn-Fe base alloy having Fe content of 10 to 30 wt.%, containing 0.005 to 5 wt.% of at least one of silica, alumina, titanium oxide, magnesia, chromium oxide and zirconium oxide, and (ii) an upper layer electroplated coating provided on said lower layer electroplated coating and comprising an Fe-B base alloy having B (boron) content of 0.001 to 3 wt.% or an Fe-rich Fe-Zn base alloy having Fe content of 60 wt.% or more.

4,908,280

SCRATCH AND CORROSION RESISTANT, FORMABLE NICKEL PLATED STEEL SHEET, AND MANUFACTURING METHOD

Hitoshi Omura, Kudamatsu; Katsutada Yamada, Hikari, and Hideo Omura, Hofu, all of Japan, assignors to Toyo Kohan Co., Ltd., Chiyoda, Japan

Filed Jul. 10, 1989, Ser. No. 377,485

Int. Cl.[4] B32B *15/04*; C25D *5/14, 5/50*

U.S. Cl. 428—679 **9 Claims**

1. An anti-scratch, corrosion resistant nickel plated steel sheet or strip comprising a base steel having a first layer of a nickel ferrous alloy with a coating weight of 5 to 45 g/m^2 by weight of nickel on each side of said sheet or strip, and further comprising a second layer of a nickel phosphorus alloy plating with a coating weight of 1 to 18 g/m^2 by weight of nickel and a phosphorus content of 3 to 15% by weight on at least one side of said nickel plated steel sheet and strip.

4,908,281

METAL/AIR BATTERY WITH RECIRCULATING ELECTROLYTE

Wilfrid B. O'Callaghan, Kingston, Ontario, Canada, assignor to Alcan International Limited, Montreal, Quebec, Canada

Filed Sep. 23, 1988, Ser. No. 248,383

Claims priority, application Canada, Sep. 25, 1987, 547843

Int. Cl.[4] H01M *8/04*

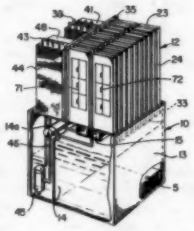
U.S. Cl. 429—27 **13 Claims**

1. A battery comprising:

(a) a tank defining a reservoir for liquid electrolyte,

(b) a support panel mounted in the tank above the electrolyte reservoir,

(c) a plurality of metal-air cells mounted in side-by-side relationship on said support panel with air gaps therebetween, each cell comprising a pair of spaced-apart flat side walls joined by end faces and top and bottom faces, said side walls including air cathodes, a metal anode mounted between and spaced from said flat side walls, an electrolyte inlet connector below the lower edge of the anode and an electrolyte outlet connector, and a vertical internal divider wall extending from the bottom face to a short distance below the top face, said divider wall forming an



electrolyte chamber connected to said electrolyte inlet connector and an overflow chamber connected to said electrolyte outlet connector said connectors being adapted to extend through openings in said support panel, and said outlet connector being adapted to return electrolyte to the reservoir, and

(d) circuit means for connecting said cells to an external load.

4,908,282

RECOMBINANT BATTERY AND PLATE SEPARATOR THEREFOR

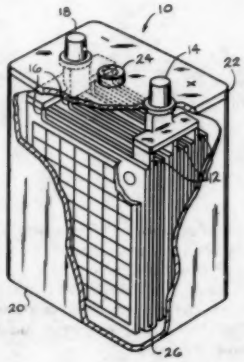
John P. Badger, Genoa, Ohio, assignor to Hollingsworth and Vose Company, East Walpole, Mass.

PCT No. PCT/US87/02941, § 371 Date Jul. 11, 1988, § 102(e) Date Jul. 11, 1988, PCT Pub. No. WO88/03710, PCT Pub. Date May 19, 1988

PCT Filed Nov. 12, 1987, Ser. No. 261,700

Int. Cl.[4] H01M *2/16*

U.S. Cl. 429—59 **15 Claims**



1. As a battery plate separator, a fibrous sheet consisting essentially of first fibers which are inert to a particular aqueous electrolyte and which impart to the sheet a given absorbency greater than 90 percent relative to that electrolyte when surfactant-free and second fibers which are inert to that electrolyte and which impart to the sheet a different absorbency less than 80 percent relative to that electrolyte when surfactant-

free, the first and second fibers being present in such proportions that the sheet has an absorbency with respect to that electrolyte, when surfactant-free, of from 75 to 95 percent.

4,908,283

PREPARATION OF ION CONDUCTIVE SOLID ELECTROLYTE

Toru Takahashi; Ryuichi Shimizu; Tsuomu Suchiro, and Hidetomo Ashitaka, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

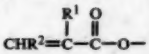
Continuation-in-part of Ser. No. 106,641, Oct. 8, 1987. This application Apr. 24, 1989, Ser. No. 342,122

Claims priority, application Japan, Oct. 9, 1986, 61-239041; Oct. 9, 1986, 61-239042; Nov. 26, 1986, 61-281148; Jan. 23, 1987, 62-12273

Int. Cl.[4] H01M *6/18/10/26*

U.S. Cl. 429—192 16 Claims

1. A process for the preparation of an ion conductive solid electrolyte, which comprises curing a composition comprising an acryloyl-denatured polyalkylene oxide having a molecular weight of 200 to 3,000 which comprises an acryloyl group having the formula:

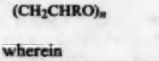


wherein

R^1 is hydrogen or a lower alkyl group having 1–6 carbon atoms; and

R^2 is hydrogen or an aromatic group;

and a polyalkylene oxide chain having the formula:



wherein

n is an integer of from 1 to 30; and

R is hydrogen or a lower alkyl group having 1–6 carbon atoms,

and an inorganic ion salt by irradiating the composition with active rays.

4,908,284

SOLID STATE BATTERIES

Alan Hooper, Oxfordshire; John M. North, Berkshire, and Robin J. Neat, Oxfordshire, all of England, assignors to Dowty Electronic Components Limited, Buckinghamshire, United Kingdom

Filed Jun. 14, 1988, Ser. No. 206,350

Claims priority, application United Kingdom, Jun. 17, 1987, 8714239

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—192 13 Claims

1. A material which includes a complex of a salt formed between a metal ion capable of existing in at least two stable valency states or an aluminium ion together with a suitable anion and a solid plastics polymeric composition capable of forming a donor acceptor type bond with the metal or aluminium ion, wherein the material exhibits both ionic and electronic conductivities which are of the same order of magnitude as each other.

4,908,285

HOLOGRAM MEMBER

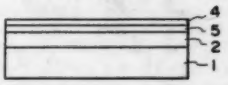
Nobuo Kushibiki, Yamato; Yoko Yoshinaga, Machida; Naosato Taniguchi, Atsugi, and Tetsuro Kuwayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,172

Claims priority, application Japan, May 18, 1987, 62-118964; May 18, 1987, 62-118965; May 21, 1987, 62-122414; May 21, 1987, 62-122415; May 21, 1987, 62-122416; May 21, 1987, 62-122417; May 21, 1987, 62-122418

Int. Cl.[4] G03H *1/04, 1/02;* A61F *13/02*

U.S. Cl. 430—1 36 Claims



1. A hologram member comprising a substrate and a film in which a volume type phase hologram is recorded, provided peelably on said substrate wherein said substrate has a thickness of from 5–200 μm.

4,908,286

IMAGE-RECEIVING MATERIAL FOR USE IN DIFFUSION TRANSFER REVERSAL

Ludovicus H. Vervloet, Kessel; Willy P. De Smedt, Mechlin; Leon L. Vermeulen, Herenthout, and Piet Kok, Ghent, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Continuation of Ser. No. 143,378, Jan. 13, 1988, abandoned. This application May 3, 1989, Ser. No. 348,122

Claims priority, application European Pat. Off., Jan. 16, 1987, 87200059.1

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] G03C *5/54, 1/76*

U.S. Cl. 430—10 13 Claims

9. An image-receiving material suited for silver complex diffusion transfer (DTR) processing, wherein a polyvinyl chloride resin support is directly coated with a DTR-image receiving layer that contains developing nuclei in a binder medium, characterized in that said image-receiving layer comprises in percent by weight on its total weight the following ingredients:

1.3% to 80% of proteinaceous colloid,

0% to 85% of colloidal silica,

1.0% to 70% of an ionogenic polyester-polyurethane applied from an aqueous dispersion wherein isocyanate groups still present in its structure have reacted with an inomeric compound containing at least one active hydrogen atom and a carboxylate or sulphonate salt group, the number of said salt groups being sufficient to render said polyester polyurethane dispersible in an aqueous medium, and 0% to 30% of a siloxane forming a reaction product with the colloidal silica, the dry coverage of the image receiving layer being in the range of 0.2 g to 16 g per m2, said siloxane being present when said silica is present in an amount substantially sufficient to form said reaction product with said silica, said image receiving layer containing a black-and-white photograph and being incorporated in a laminate sandwiched between a clear protective resin cover sheet and said polyvinyl chloride support.

4,908,287

IMAGE FORMING METHOD AND APPARATUS THEREFOR

Masakazu Fukuchi, and Satoshi Haneda, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 68,140
Claims priority, application Japan, Jul. 4, 1986, 61-157570
Int. Cl.[4] G03G 13/16
U.S. Cl. 430—58 22 Claims

1. An image forming method comprising the steps of;

forming a first latent image corresponding to a first color on a region of an image retainer with a first charging means and a first exposing means and developing the first latent image with a developing means containing toner of said first color during a first rotation of said image retainer;

forming a second latent image corresponding to a second color on said region with a second charging means on a second exposing means and developing the second latent image with a developing means containing toner of said second color during said first rotation of said image retainer and;

forming a third latent image corresponding to a third color on said region of the image retainer with said second charging means and said second exposing means and developing the third latent image with a developing means containing toner of said third color during a second rotation of said image retainer.

4,908,288

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Hideki Anayama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,220
Claims priority, application Japan, Aug. 27, 1987, 62-211339
Int. Cl.[4] G03G 15/02
U.S. Cl. 430—58 7 Claims

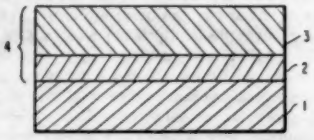
1. An electrophotographic photosensitive member having a charge generation layer and a charge transport layer on a conductive substrate, wherein the monomer unit constituting a polymer binder contained in said charge generation layer is the same as that constituting a polymer binder contained in said charge transport layer, and the weight-averaged molecular weight of the polymer binder contained in said charge generation layer is in a range from two to six times of that of the polymer binder contained in said charge transport layer.

4,908,289

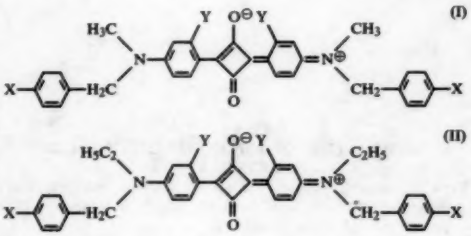
PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY

Hiroyuki Tanaka; Seki Kin, and Lyong S. Pu, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 744,590, Jun. 14, 1985, abandoned, which is a division of Ser. No. 682,203, Dec. 17, 1984, abandoned. This application Dec. 17, 1986, Ser. No. 942,922
Claims priority, application Japan, Dec. 16, 1983, 58-236203; Dec. 16, 1983, 58-236204; Dec. 16, 1983, 58-236205
Int. Cl.[4] G03G 5/14, 5/06
U.S. Cl. 430—59 22 Claims



1. A photoreceptor for electrophotography, comprising an electroconductive support and a light-sensitive layer comprising a charge transport layer and a charge generation layer containing a squarylium compound of general formulae (I) or (II):



wherein X is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a hydroxyl group, an alkoxy group having 1 to 4 carbon atoms, or a halogen atom; Y is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a hydroxyl group, or an alkoxy group having 1 to 4 carbon atoms.

3. The photoreceptor claimed in claim 1, wherein said charge transport layer selected from the group consisting of triarylpyrazoline, triphenylmethane, oxadiazole, tetraphenylbenzidine or trinitrofluorenone and a binder resin.

4,908,290

TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Yoichiro Watanabe, Fuji; Mitsuo Aoki; Tetsuo Isoda, both of Namazu; Nobuhiro Nakayama, Susono; Fumihiro Sasaki, and Karumi Kakigawa, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 120,563
Claims priority, application Japan, Nov. 17, 1986, 61-274830; May 28, 1987, 62-134387
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—106.6 5 Claims

1. A toner for developing latent electrostatic images comprising a colorant, and a binder agent which comprises (i) polyester resin having a weight average molecular weight of 8,000 to 16,000, and a glass transition temperature (Tg) of 50° C. to 65° C., or epoxy resin having a weight average molecular weight of 2,000 to 12,000, and a glass transition temperature (Tg) of 50° C. to 65° C., and (ii) styrene - methyl acrylate copolymer having a weight average molecular weight of 200,000 to 500,000, a gel content of 15 to 50%, and a glass transition temperature (Tg) of 55° C. to 70° C.

4,908,291

METHOD OF REGULATING THE THICKNESS OF A DEVELOPER LAYER CONTAINING MAGNETIC CARRIER AND TONER PARTICLES

Hiroshi Fuma; Akihiko Tamura; Masahiko Itaya; Hisashi Shoji, and Shinobu Soma, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

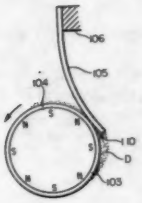
Continuation of Ser. No. 15,376, Feb. 17, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,107
Claims priority, application Japan, Feb. 18, 1986, 61-34318; Feb. 18, 1986, 61-34319
Int. Cl.[4] G03G 13/09
U.S. Cl. 430—122 43 Claims

1. A method of regulating the thickness of a developer layer containing magnetic carrier particles and toner particles, said developer layer formed on a developer transporting means comprising a magnet member therein, said method comprising;

transporting the developer layer by the developer transporting means to an elastic layer-thickness regulating means disposed so as to face and come in pressing contact with the transporting means,

lifting the elastic layer-thickness regulating means by the

transported developer, so that a gap made substantially equal to an average diameter of one of said carrier particles is formed between the lifted elastic layer-thickness



regulating elastic means and said developer transporting means, and

regulating the thickness of the developer layer by transporting the developer so as to pass through said gap.

4,908,292

METHOD OF MAKING AN ELECTROPHOTOGRAPHIC INORGANIC PHOTOSENSITIVE ELEMENT USING ULTRAVIOLET RADIATION

Yukio Ide, Mishima; Kohichi Ohshima, Numazu; Itaru Fujimura, Numazu, and Yoshiyuki Kageyama, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 936,973, Nov. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 906,591, Sep. 9, 1986, abandoned, which is a continuation of Ser. No. 475,845, Mar. 16, 1983, abandoned. This application Jul. 11, 1988, Ser. No. 217,036

Claims priority, application Japan, Mar. 17, 1982, 57-40673

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—128 **13 Claims**

1. A method of manufacturing a photosensitive member including a substrate and a photoconductive layer formed on said substrate, comprising the steps of:

placing said substrate in a reaction chamber having a preheating region and a photoexcitation region, said substrate being placed in said photoexcitation region;

introducing a reacting gas containing predetermined components for forming said photoconductive layer on said substrate into said reaction chamber first through said preheating region for preheating said reacting gas and then through said photoexcitation region; and

irradiating ultraviolet light in said photoexcitation region to activate said predetermined components while maintaining said substrate at a predetermined temperature level thereby causing said predetermined components to deposit on said substrate by photochemical reaction.

4,908,293

SUPERHIGH CONTRAST NEGATIVE TYPE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kazunobu Katoh; Yoshihiro Takagi; Kimitaka Kameoka; Junji Miyata, and Toshinao Ukai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 4, 1987, Ser. No. 93,341

Claims priority, application Japan, Sep. 5, 1986, 61-209169

Int. Cl.[4] G03C *1/36*

U.S. Cl. 430—264 **7 Claims**

1. A superhigh contrast negative type silver halide photographic material comprising a support having provided thereon at least one silver halide emulsion layer, wherein said emulsion layer or at least one other hydrophilic colloid layer contains at least one hydrazine derivative and at least one organic desensitizer having at least one water-soluble group or alkali-dissociative group.

4,908,294

OPTICAL INFORMATION RECORDING MEDIUM

Toshiyuki Kasno; Hitoshi Watanabe, and Kohei Hamanishi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1987, Ser. No. 11,896

Claims priority, application Japan, Feb. 13, 1986, 61-29328; Feb. 14, 1986, 61-30151; Feb. 19, 1986, 61-34716; Feb. 20, 1986, 61-35491; May 8, 1986, 61-105290

Int. Cl.[4] G11B *7/24*; G03C *1/72, 5/16*; B41M *5/26*

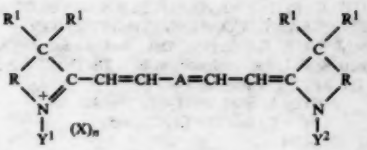
U.S. Cl. 430—270 **12 Claims**

1. An optical information recording medium, which is capable of recording signals for retrieval, based on differences or changes in reflectivity, comprising:

an optical information recording layer; and

a carrier carrying said recording layer,

said recording layer comprising an organic dye represented by the formula:



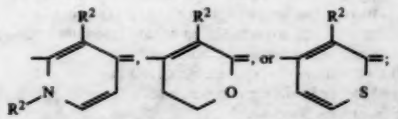
where

R is 1,2-naphthylene group, 2,3-naphthylene group or 3,4-naphthylene group;

n is 1;

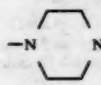
R^1 is an alkyl group having 1 to 6 carbon atoms, an aralkyl group or phenyl group;

A is



R^2 is a hydrogen atom, a halogen atom, an alkyl group having 1 to 6 carbon atoms,

where pH is phenyl group, or



R^3 is an alkyl group having 1 to 6 carbon atoms;

X is an anion selected from an anion group consisting of perchlorate, fluoroborate, iodide, chloride, bromide or p-toluenesulfonate;

Y^1 is an alkyl group having 1 to 18 carbon atoms, $-R^4OR^5$, $-R^4COR^5$, or $-R^4COOR^5$;

Y^2 is the same as Y^1;

R^4 is an alkylene group having 1 to 20 carbon atoms; and

R^5 is an alkyl group having 1 to 18 carbon atoms, or a phenyl group.

4,908,295

PHOTOGRAPHIC SUPPORT

Tetsuro Fuchizawa, and Kazuyuki Koike, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1989, Ser. No. 301,764

Claims priority, application Japan, Jan. 26, 1988, 63-14896; Apr. 6, 1988, 63-84667

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—272 2 Claims

1. A photographic support having a secondary diffuse-reflective surface wherein a thin metal layer having a secondary diffuse-reflectivity is provided on the matted surface of a substrate, and an adhesive layer is provided on the thin metal layer, and the center plane average roughness, as determined by a three dimensional roughness measuring apparatus, of the thin metal layer is 0.1 to 1.2 μm.

4,908,296

PHOTOSENSITIVE SEMI-AQUEOUS DEVELOPABLE CERAMIC COATING COMPOSITION

William J. Nebe, Wilmington, Del., and James J. Osborne, Kennett Square, Pa., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed May 31, 1988, Ser. No. 200,386

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—281 7 Claims

1. In a photosensitive ceramic coating composition which is fireable in a substantially nonoxidizing atmosphere comprising an admixture of:

(a) finely divided particles of ceramic solids having a surface area-to-weight ratio of no more than 10 m^2/g and at least 80 wt. % of the particles having a size of 1–10 μm, and

(b) finely divided particles of an inorganic binder having a glass transition temperature in the range from of 550° to 825° C., a surface area-to-weight ratio of no more than 10 m^2/g and at least 90 wt. % of the particles having a size of 1–10 μm, the weight ratio of (b) to (a) being in a range from 0.6 to 2, dispersed in an organic medium comprising

(c) an organic polymeric binder, and

(d) a photoinitiation system, dissolved in

(e) photohardenable monomer, and

(f) an organic medium

wherein the improvement comprises an organic polymeric binder containing a copolymer or interpolymer of a C_1–C_{10} alkyl acrylate, or C_1–C_{10} alkyl methacrylate, and an ethylenically unsaturated carboxylic acid, wherein a moiety in the binder derived from the unsaturated carboxylic acid comprises from 5 to less than 15 weight percent of the polymer and wherein the binder has a molecular weight not greater than 100,000 and wherein the composition upon imagewise exposure to actinic radiation is developable in an aqueous solution containing by weight 0.62 percent sodium borate and 8.7 percent butyl cellosolve.

4,908,297

COATING COMPOSITIONS

Robert A. Head, Upton, and Steven Johnson, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, Millbank, England

Filed Sep. 9, 1987, Ser. No. 94,699

Claims priority, application United Kingdom, Sep. 10, 1986, 8621793

Int. Cl.[4] C07L *125/077*

U.S. Cl. 430—284 15 Claims

1. An optical glass fibre having a protective coating obtained by photocuring thereon a photocurable coating composition comprising:

(a) a polyethylenically unsaturated polyurethane derived from a polyol having pendent fluoroalkyl groups of the formula:

wherein Z represents Cl or F(CF2)n— wherein n is an integer from 0 to 10,

(b) an ethylenically unsaturated monomer which is a liquid solvent for the polyethylenically unsaturated polyurethane and is copolymerisable therewith, and

(c) a photo-initiator composition.

4,908,298

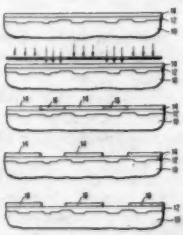
METHOD OF CREATING PATTERNED MULTILAYER FILMS FOR USE IN PRODUCTION OF SEMICONDUCTOR CIRCUITS AND SYSTEMS

George J. Hefferon, Fishkill, N.Y.; Hiroshi Ito, San Jose, Calif.; Scott A. MacDonald, San Jose, Calif., and Carlton G. Willson, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 713,370, Mar. 19, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 117,383

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—313 15 Claims



1. A method of creating patterned multilayer films for use in the production of semiconductor circuits, and systems wherein at least one of said multilayers is etch-resistant, comprising:

(a) applying an imaging layer of polymeric material over the surface of at least one underlaying layer of polymeric material;

(b) using radiation to create a latent image within said imaging layer;

(c) developing said latent image to create a patterned layer of polymeric material over the surface of said at least one underlaying layer of polymeric material;

(d) altering said developed, patterned layer of polymeric material so that it is capable of reacting with an organometallic reagent; and

(e) reacting said patterned layer of polymeric material with an organometallic reagent in order to render said patterned layer of polymeric material etch resistant.

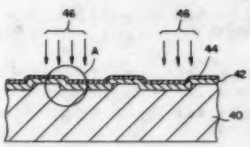
15. The method of claims 1, 2, 3, 6, 7, 9 or 12 including an additional step wherein the pattern in said etch-resistant, patterned layer is transferred to at least one of said at least one layers of polymeric material, using an oxygen plasma or reactive ion etching.

4,908,299

PATTERN FORMING METHOD

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 30,612, Mar. 27, 1987, Pat. No. 4,824,766, which is a continuation of Ser. No. 751,256, Jul. 2, 1985, Pat. No. 4,751,171. This application Dec. 30, 1988, Ser. No. 292,553
Claims priority, application Japan, Jul. 3, 1984, 59-138155; Oct. 16, 1984, 59-216641; Dec. 10, 1984, 59-259327
Int. Cl.[4] G03F *7/10, 7/26*
U.S. Cl. 430—323 1 Claim



1. A pattern forming method comprising:
a step of forming several layers of a sensitivee Langmuir-Blodgett film comprising a straight chain hydrocarbon containing Si atoms and responsive groups of acetylene, cyano or vinyl at one end of the hydrocarbon chain, on an arbitrary substrate covered with an organic film;
a step of forming a pattern of the Langmuir-Blodgett film by selectively polymerizing or decomposing the sensitive Langmuir-Blodgett film by irradiation of energy beams, followed by development; and
a step of selectively etching said organic film with plasma containing oxygen, with the pattern of said Langmuir-Blodgett film as a mask.

4,908,300

METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shigeharu Koboshi, Sagamihara; Moeko Higuchi, Houya, and Shinji Kadota, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 188,147, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 886,243, Jul. 16, 1986, abandoned. This application Oct. 14, 1988, Ser. No. 258,044
Claims priority, application Japan, Jul. 18, 1985, 60-160943; Sep. 25, 1985, 60-213905; Oct. 9, 1985, 60-226612
Int. Cl.[4] C03C *5/36, 5/38, 5/44, 7/00*
U.S. Cl. 430—393 12 Claims

1. A method of processing a silver halide color photographic material comprising the steps of:
(a) developing an imagewise exposed silver halide color photographic material comprising (i) a support and (ii) photographic component layers including an anti-halation layer containing black colloid silver, a blue-sensitive, a green-sensitive and a red-sensitive silver halide photographic emulsion layer provided on one side of said support, at least one of said emulsion layers comprising a silver halide containing from 0.5 to 25 mol% of silver iodide,
(b) maintaining the total dry-thickness of said photographic component layers from 8 to 25 μm, and the swelling rate $T_{\frac{1}{2}}$ of said photographic component layers at not more than 25 sec, and
(c) bleach-fixing said developed photographic material with a bleach-fixing solution containing an organic acid ferric complex.

4,908,301

COLOR-SELF-DEVELOPING, MICROCAPSULAR TONER PARTICLES

Paul V. Grosso, West Hartford; Michael J. Morgan, Northford; Feagin A. Wing, Jr., Farmington, and Williard F. Burt, Bristol, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 171,614, Mar. 23, 1988, Pat. No. 4,869,981. This application Feb. 10, 1989, Ser. No. 308,713
Int. Cl.[4] G03G *9/08, 13/01*
U.S. Cl. 430—45 13 Claims

1. A developer-bearing, color-self-developing, electrostatically-depositable, microcapsular toner particle comprising a shell and a core said shell being fabricated of a polymer, and said core comprising as a color precursor a colorless, chromogenic material, and additionally containing a radiation-sensitive material, said chromogenic material being capable of becoming colored upon contact with a developer, said shell possessing a charge characteristic to render said toner particle electrostatically-depositable, said shell having a developer on the outer surface thereof, the shell of said toner particle being rupturable to release said chromogenic material, thereby contacting and reacting said released chromogenic material with said developer to form a colored image.

11. A color imaging method which comprises the steps of:
(a) forming a latent image on a photoconductive or dielectric substrate,
(b) electrostatically depositing a blended toner composition onto a charged or uncharged surface of said substrate to form a toned image which is a positive or reverse image as compared to said latent image, said blended toner composition comprising at least two different toners, each of said toners comprising a color precursor contained in photosensitive toner particles, said toner particles bearing a developer on the surface thereof,
(c) selectively photohardening or photosoftening at least a portion of said toner particles by imagewise exposure to appropriate wavelengths of radiation to provide harder toner particles and softer, rupturable toner particles,
(d) transferring said harder toner particles and said rupturable toner particles to a copy surface, and
(e) rupturing at least a portion of said toner particles on said copy surface to release color precursor(s) from said rupturable toner particles, thereby contacting and reacting said developer with said released color precursor(s) to form a color image on said copy surface.

4,908,302

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Ivano Delpato, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 27, 1988, Ser. No. 263,398
Claims priority, application Italy, Nov. 5, 1987, 22531
Int. Cl.[4] G03C *1/08*
U.S. Cl. 430—544 14 Claims

1. A silver halide color photographic light-sensitive material which comprises a support having coated thereon at least one silver halide emulsion layer containing a diketomethylene yellow dye forming coupler having, in the coupling active position thereof, a group which provides a compound having a development inhibiting property when the group is released from the coupler active position upon color development reaction, wherein said group is a 1-(fluoroalkylsubstituted-phenyl)-tetrazolyl-5-thio group.

4,908,303

SILVER HALIDE PHOTOGRAPHIC MATERIALS SPECTRALLY SENSITIZED WITH LUMINOUS DYE

Tsutomu Miyasaka; Tadaaki Tani, and Tadao Sugimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 10, 1988, Ser. No. 154,417

Claims priority, application Japan, Feb. 12, 1987, 62-28349; Feb. 12, 1987, 62-28350

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] G03C 1/12, 1/28

U.S. Cl. 430—569 14 Claims

1. A silver halide photographic material containing at least one silver halide emulsion layer, in which (I) the silver halide grains constituting the emulsion layer have been spectrally sensitized by at least one adsorbable spectral sensitizing dye added thereto before the completion of the formation of said grains, and (2) at least one luminous dye which has a quantum efficiency of 0.1 to 1.0 when the concentration thereof in dry gelatin at room temperature is 10^{-4} mol/dm^3 and which can be substantially completely removed by development is added to a hydrophilic dispersion medium of the silver halide emulsion layer in a concentration of 2.0 mmol/dm^3 or more, exclusive of the silver halide grains, in the dispersion medium, which luminous dye is capable of adsorbing visible light and fluorescing in the visible region and in which the luminous dye in the dispersion medium is substantially non-adsorbable and the adsorbability of the dye to the silver halide grains is 5×10^{-7} mol/m^2 or less in an aqueous 5% (by weight) gelatin solution of silver bromide grains having a (III) crystal plane at a temperature of 40° C. and a pH value of 6.5±0.05 and a dye concentration of 10^{-4} mol/liter of said solution phase.

4,908,304

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Shinichi Nakamura, Tokyo, and Toshiaki Shibue, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

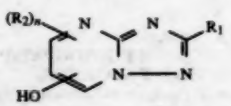
Continuation of Ser. No. 178,878, Mar. 31, 1988, abandoned, which is a continuation of Ser. No. 861,570, May 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 776,296, Sep. 16, 1985, abandoned. This application May 12, 1989, Ser. No. 352,653

Claims priority, application Japan, Sep. 21, 1984, 59-198845

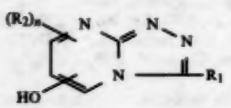
Int. Cl.[4] G03C 1/06

U.S. Cl. 430—615 5 Claims

1. A silver halide photographic light-sensitive element comprising a paper support bearing thereon at least one silver halide emulsion layer containing a hydroxytetrazaindene compound represented by the Formula [I] or [II]



Formula [I]



Formula [II]

wherein, R_1 and R_2 individually represent hydrogen, an aliphatic group or an aromatic group; n is an integer of 1 or 2, said compound being present in an amount of 0.001 to 0.5 mols per mol of silver halide in said silver halide emulsion layer; and a resin layer interposed between said paper support and said silver halide emulsion layer, said resin layer consisting essentially of an electron beam-hardenable component comprising a prepolymer having at least two ethylenic unsaturated double bonds.

4,908,305

COMPETITIVE ELISA FOR DETERMINATION OF NEUTRALIZING IBDV ANTIBODY

David B. Snyder, Seabrook, Md., assignor to The University of Maryland, College Park, Md.

Continuation-in-part of Ser. No. 61,083, Jun. 12, 1987. This application Oct. 21, 1987, Ser. No. 110,738

Int. Cl.[4] G01N 33/53, 33/577; C07K 15/14; C12N 1/00

U.S. Cl. 435—5 9 Claims

1. A method for determining the level of infectious bursal disease virus (IBDV) neutralizing antibody in poultry, comprising:

A, admixing (1) a predetermined amount of labeled monoclonal antibody having the IBDV neutralizing capability of the monoclonal antibody expressed by hybridoma cell line ATCC-HB-9490, (2) infectious bursal disease virus antibody-containing fluid from said poultry, and (3) a predetermined amount of infectious bursal disease virus antigen;

B, determining the amount of labeled monoclonal antibody not bound to said antigen in said admixing step, by measurement of the label attached to either said unbound monoclonal antibody or the label attached to monoclonal antibody bound to said antigen,

C, comparing said amount of unbound labeled monoclonal antibody with a standard value for the amount of labeled monoclonal antibody remaining unbound in the absence of said poultry fluid as a measure of the level of IBDV neutralizing antibody in said fluid.

4,908,306

HUMAN PAPILLOMAVIRUS 56 NUCLEIC ACID HYBRIDIZATION PROBES AND METHODS FOR EMPLOYING THE SAME

Attila T. Lorincz, Gaithersburg, Md., assignor to Life Technologies, Inc., Gaithersburg, Md.

Continuation-in-part of Ser. No. 114,985, Oct. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 60,883, Jun. 12, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 343,699

Int. Cl.[4] C12Q 1/70, 1/68; G01N 33/53; C07H 15/12

U.S. Cl. 435—5 94 Claims

34. An HPV 56 hybridization probe comprising a member selected from the group consisting of (i) HPV 56 DNA or fragments thereof labelled with a marker and (ii) HPV 56 RNA or fragments thereof labelled with a marker.

4,908,307

HYBRIDIZATION METHOD AND PROBE FOR DETECTING NUCLEIC ACID SEQUENCES

Karin D. Rodland, 3330 NE. 138th Pl., Portland, Oreg. 97230, and Peter J. Russell, Portland, Oreg., assignors to Karin D. Rodland, Portland, Oreg.

Filed Dec. 19, 1986, Ser. No. 944,678

Int. Cl.[4] C12Q 1/68; G01N 33/566; C07H 15/12; C12N 15/00

U.S. Cl. 435—6 27 Claims

1. A method for detecting the presence of specific nucleic acid base sequences in a sample suspected of containing said sequences in single-stranded form comprising:

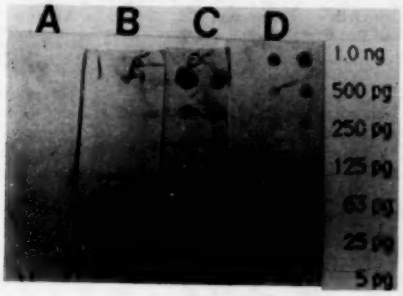
providing nucleic acid probe molecules which in single-stranded form are capable of binding specifically to said suspected nucleic acid base sequences and contain at least one thionucleotide;

converting any double-stranded probe molecules to single-stranded form;

annealing said single-stranded, thionucleotide-containing probe molecules to said suspected nucleic acid base sequences in the presence of a concentration of multivalent cations capable of promoting the formation of ionic inter-

actions between phosphorothioate groups of said probe molecules;

subsequent to said annealing, detecting the presence of any said probe molecules annealed to said suspected nucleic acid base sequences; and



prior to said detecting, providing said probe molecules with a detectable label to provide a means for later detecting the presence of any said probe molecules annealed to said suspected nucleic acid base sequences.

4,908,308

METHOD FOR DETECTING ANIMAL-INFECTIVE PROTOZOA IN VITRO AND A METHOD FOR DETECTING AGENTS WHICH BLOCK THE DIFFERENTIATION THEREOF

Lex H. T. Van der Ploeg; Suzanne H. Giannini, and Charles R. Cantor, all of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Jun. 19, 1985, Ser. No. 746,282
Int. Cl.[4] C12Q *1/68, 1/18, 1/04, 1/06*
U.S. Cl. 435—6 **48 Claims**

1. A method for identifying in vitro whether a parasitic protozoan is a mammalian-infective form of the parasitic protozoan which comprises recovering total mRNA from the parasitic protozoan to be identified and detecting in the mRNA so recovered the presence of a mRNA transcript encoding a heat shock protein associated with the mammalian-infective form of the parasitic protozoan, which transcript is present only in the mammalian-infective form of the parasitic protozoan, wherein the detecting involves contacting the total mRNA recovered from the parasitic protozoan to be identified under hybridizing conditions with a detectable oligonucleotide which is complementary to at least a portion of the mRNA transcript which encodes the heat shock protein associated with the mammalian-infective form of the parasitic protozoan and detecting the formation of hybridization complexes between the mRNA transcript and the detectable oligonucleotide and thereby identifying in vitro the parasitic protozoan as the mammalian-infective parasitic form of the parasitic protozoan.

4,908,309

METHOD OF DETECTING CYSTEINE PROTEASES

Kyujin Cho, Livermore, and David W. Rasnick, Sunol, both of Calif., assignors to Prototek, Inc., Dublin, Calif.

Division of Ser. No. 838,531, Mar. 11, 1986, Pat. No. 4,771,123. This application Sep. 8, 1987, Ser. No. 94,145
Int. Cl.[4] C12Q *1/38*
U.S. Cl. 435—23 **9 Claims**

1. A method of detecting cysteine proteases in a sample fluid, the method comprising the steps of:

forming a mixture comprising a buffering agent, the sample fluid, and an amount effective as a substrate for cysteine proteases of a compound, or salt thereof, defined by the formula:

$(AA)_n$—AAψ[CS]-W

wherein:

$(AA)_n$ is a blocked or unblocked, thionated or unthionated amino acid whenever n=1, and $(AA)_n$ is a peptide consisting of blocked or unblocked, thionated or unthionated amino acids whenever n is greater than one,

n is in the range between 0 and 12 inclusive,

AAψ[CS] is a blocked or unblocked amino acid whose alpha carbonyl oxygen has been replaced with a sulfur atom, and whose alpha amine forms a peptide bond with the alpha carbonyl of the adjacent amino acid of the $(AA)_n$ moiety whenever n is greater than or equal to one, and

W is a chromogenic or fluorogenic leaving group covalently attached to the carbon atom of the alpha carbonyl of AAψ[CS]; and

relating the change in color or fluorescence of the mixture to the activity of the cysteine protease as said compound is hydrolysed thereby.

4,908,310

WATER INSOLUBLE POLYSACCHARIDE POLYMER AND METHOD THEREOF

Clarence S. Buller, Lawrence, Kans., assignor to University of Kansas, Lawrence, Kans.

Filed Dec. 23, 1987, Ser. No. 137,367
Int. Cl.[4] C12P *19/04, 19/14;* C12R *1/07;* C07G *17/001*
U.S. Cl. 435—101 **6 Claims**

1. A process for the preparation of polysaccharide polymer, comprising the steps of:

providing a quantity of bacteria selected from the group consisting of Cellulomonas sp. (ATCC No. 21399), *Cellulomonas flavigena* (ATCC No. 482) and *Cellulomonas flavigena* 819 (ATCC No. 53703);

culturing said bacteria in a nutrient medium including an excess of assimilable carbon and energy sources,

the pH of said medium being maintained at a level of above about 6 during said culturing step,

said culturing step being carried out until the occurence of cell aggregation and concomitant formation of cell-bound β 1,3-glucan polysaccharide polymer; and

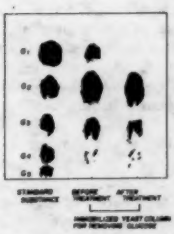
recovering said polysaccharide polymer.

4,908,311

PROCESS FOR ENZYMATIC PREPARATION OF CELLOOLIGOSACCHARIDES

Takashi Sasaki; Hajime Taniguchi, and Keiji Kainuma, all of Tsukuba, Japan, assignors to Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Japan

Filed Aug. 25, 1988, Ser. No. 236,555
Claims priority, application Japan, Apr. 6, 1988, 63-83139
Int. Cl.[4] C12P *19/04, 7/08;* C12N *9/42;* D21C *1/00*
U.S. Cl. 435—101 **7 Claims**



1. A continuous process for preparing cellooligosaccharide

from a cellulose-containing substance in an aqueous medium comprising the steps of, in a reaction vessel,

reacting the cellulose in the aqueous medium with cellulase produced by a microorganism designated cellvibrio gilvus, to produce a saccharification solution including the cellooligosaccharide and the reaction products;

continuously separating the saccharification solution from the cellulose to obtain the cellooligosaccharide; and

continuously adding aqueous medium to the reaction vessel to replace separated saccharification solution, and wherein

the reaction vessel is an ultrafiltration reactor and

the continuous separation step comprises ultrafiltering the saccharification solution using a membrane having a fractional molecular weight of 1,000 to 20,000 and removing the filtered saccharification solution from the reactor.

4,908,312

PROCESS FOR PRODUCING PHENYLANANINE

Akio Ozaki; Ryoichi Katsumata, both of Machida, and Tetsuo Oka, Yokohama, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 613,209, May 23, 1984, abandoned. This application Dec. 7, 1988, Ser. No. 281,920

Claims priority, application Japan, May 28, 1983, 58-94392

Int. Cl.[4] C07H *21/00;* **C12N** *15/00, 1/20;* **C12P** *13/22;* **C12R** *1/13, 1/15*

U.S. Cl. 435—108 **5 Claims**

1. A process for producing phenylalanine which comprises transforming a host microorganism belonging to the genus *Corynebacterium* or *Brevibacterium* with a recombinant DNA comprising a DNA fragment containing a gene coding for at least one of chorismate mutase and prephenate dehydratase obtained from a microorganism belonging to the genus *Corynebacterium* or *Brevibacterium,* culturing the transformant in a nutrient medium containing a molasses carbon source, accumulating phenylalanine in the culture medium and recovering phenylalanine therefrom.

4,908,313

PROCESS FOR PRODUCING AMIDES BY USE OF MICROOGANISMS

Yoshiaki Satoh; Yasutaka Nakashima; Kanehiko Enomoto; Atsushi Fujiwara, and Toshiaki Doi, all of Kanagawa, Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan, a part interest

Continuation of Ser. No. 627,859, Jul. 5, 1984, abandoned. This application Dec. 10, 1987, Ser. No. 131,281

Claims priority, application Japan, Jul. 12, 1983, 58-125588

Int. Cl.[4] C12P *13/02;* **C12N** *9/06*

U.S. Cl. 435—129 **11 Claims**

1. In a process for hydrating a nitrile compound by the action of a microorganism having nitrilase activity to convert the nitrile compound into the corresponding amide compound, in which the microorganism having nitrilase activity is contacted with said nitrile in a reaction vessel under conditions which effect the conversion of said nitrile to the corresponding amide, wherein the microbial cells are present in the hydrating medium in a concentration of at least 0.01% by weight, but wherein the amount of environmental light relative to the microbial cells in the reaction vessel is less than 1×10^{-2} μE/g-microbial cells-second, the improvement which comprises conducting the reaction under the conditions wherein:

(a) the microorganism having nitrilase activity is positive Gram staining,

(b) the microbial cells are allowed to accept light energy having a wavelength of about 100 to about 1000 nm in an amount of at least about 1×10^{-2} μE/g-microbial cells-second before termination of the hydration reaction, and

(c) the hydration reaction is carried out in a reaction vessel which is composed at least partly of a material which does not permit transmission therethrough of light, whereby light energy from the environment of at least 1×10^{-2} μE/g-microbial cells-second is not available in said reaction vessel.

4,908,314

PROTEIN C ACTIVATOR

Carolyn Orthner, Kensington, Md., assignor to American National Red Cross, Washington, D.C.

Filed Jul. 2, 1987, Ser. No. 69,496

Int. Cl.[4] C12N *9/50, 9/48;* **C12Q** *1/56*

U.S. Cl. 435—219 **4 Claims**

1. Isolated, substantially pure activator of protein C comprising:

(a) a molecular weight of about 37,000 as determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis;

(b) an isoelectric point of about 6.3 as determined by chromatofocussing;

(c) k_{cat}/K_m of about $3\times10^6 M^{-1}\ sec^{-1}$; and

(d) uninhibited by EDTA upto 10 mM.

4,908,315

INTEGUMENT AND METHOD FOR MICROPROPAGATION AND TISSUE CULTURING

Malcolm G. Kertz, Missouri City, Tex., assignor to Agristar, Inc., Sealy, Tex.

Filed Mar. 4, 1987, Ser. No. 21,408

Int. Cl.[4] C12N *5/00;* **C12M** *1/16, 1/12, 1/04;* **A01H** *1/00;* **A01G** *9/02*

U.S. Cl. 435—240.4 **59 Claims**

1. A tissue culturing system for an atmospheric ambient environment, comprising:

plant tissue;

a tissue culturing medium for said plant tissue;

a gas permeable, liquid impermeable, and translucent membrane having interstices smaller than a virus forming a cellule for enclosing the plant tissue and tissue culturing medium, the gas mixture and pressure within said cellule and the gas mixture and pressure of the atmospheric ambient environment being permitted to equalize by gas exchange through said membrane; said membrane being completely sealed around the plant tissue and tissue culturing medium for preventing the exposure of the plant tissue and tissue culturing medium to biological contaminants in the atmospheric ambient environment.

4,908,316

STREPTOMYCES SP. N664-30 WHICH PRODUCES AN IONOPHORE ANTIBACTERIAL AGENT

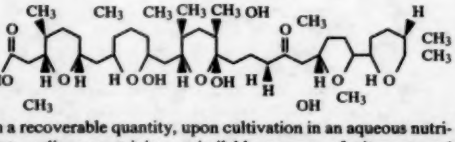
Walter P. Cullen, East Lyme; John R. Oscarson, Gales Ferry, both of Conn.; Junsuke Tone, and Hiroshi Maeda, both of Chita, Japan, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 902,353, Aug. 29, 1986. This application Feb. 29, 1988, Ser. No. 161,630

Int. Cl.[4] C12N *1/20;* **C12P** *1/06;* **C12R** *1/465*

U.S. Cl. 435—253.4 **1 Claim**

1. A biologically pure culture of the microorganism Streptomyces sp. N664-30, said culture being capable of producing a compound of the formula



in a recoverable quantity, upon cultivation in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon.

4,908,317

METAL ACCUMULATION AND POLYSACCHARIDE PRODUCTION

John M. Wood, and Francis E. Engle, both of Mound, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 526,672, Aug. 24, 1983, abandoned. This application Oct. 14, 1986, Ser. No. 918,470

Int. Cl.[4] C12N *1/12, 1/00;* C12P *19/00, 19/04*

U.S. Cl. 435—262 11 Claims

1. A method for collecting at least one metal comprising contacting a metal in an aqueous medium containing said metal with metal collecting *Cyanidium caldarium* to which said metal becomes fixed to the outer surface thereof; and separating said *Cyanidium caldarium* from said metal fixed to the outer surface thereof, said metal collecting *Cyanidium caldarium* being produced by a method comprising incrementally increasing the acidity of a medium containing substantially non-metal collecting *Cyanidium caldarium.*

4,908,318

NUCLEIC ACID EXTRACTION METHODS

Terry Lerner, Newton, Mass., assignor to Integrated Genetics, Inc., Framingham, Mass.

Filed Sep. 4, 1987, Ser. No. 93,397

Int. Cl.[4] C12N *1/08*

U.S. Cl. 435—270 7 Claims

1. A method of extracting nucleic acids from a crude buffy coat fraction in an aqueous medium, comprising the steps of:

(a) first treating said crude buffy coat fraction with biological detergent means to cause white blood cells contained in said fraction to release proteins and nucleic acids contained within said cells into said aqueous medium;

(b) solubilizing said proteins and said nucleic acids in said aqueous medium from step (a) by the addition of a solubilizing agent;

(c) precipitating said solubilized nucleic acids of step (b) with a nucleic precipitating agent under conditions whereby said proteins remain in solution; and

(d) spooling said precipitated nucleic acids.

4,908,319

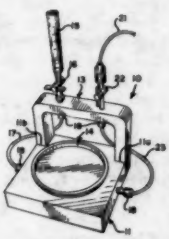
LABORATORY APPARATUS

Peter J. Smyczek, 1837 N. Himount Blvd., Milwaukee, Wis. 53208, and John A. Thompson, 2908 Ward Kline Rd., Myersville, Md. 21771

Filed Mar. 16, 1988, Ser. No. 168,994

Int. Cl.[4] C12M *3/09*

U.S. Cl. 435—285 5 Claims



1. An apparatus for conducting laboratory processes comprising:

a chambered base member having a substantial horizontal orientation with a low profile for efficient control of the temperature in said chambered base member when used with a conventional water bath, said base member including a hollow recessed chamber extending downwardly from an opening at a top of said base member, said chamber being fixed in shape at least with respect to length and width and sized to receive standard sized filters, membranes, or the like, said chamber further including input and output bores positioned adjacent a bottom of said chamber at substantially opposed positions of said chamber, being in fluid communication therewith, and extending through at least a portion of said base member to an exterior surface thereof to define openings thereon,

a low profile chamber cover member being generally shallow in its height and sized and shaped for being slidably received in said hollow recessed chamber, annular sealing means positioned on an outside of said chamber cover for sealingly engaging said cover in said recess when positioned through said opening thereof, said sliding sealed engagement between said chamber cover and said chamber recess in said base member defining a variable height chamber adapted for receiving and processing variable numbers of said filters, membranes, and the like therein,

fluid administration means in connection with said apparatus and in fluid communication with at least one of said inlet and outlet bores for precise movement of fluids as desired into and out of said chamber,

handle means extending upwardly out of a plane of said low profile base member for aiding manual grasping and moving of said apparatus by a user thereof, and

vacuum line mounting means mounted on said handle means providing for removal of solutions from said laboratory chamber.

4,908,320

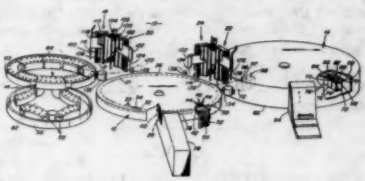
ANALYZER OPERATING METHOD

Jack J. Zakowski, Anaheim; Vincent A. Cuomo, San Bernardino; Gordon C. Blanke, Brea, and Richard C. Meyer, La Habra, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 884,461, Jul. 11, 1986, abandoned. This application May 18, 1989, Ser. No. 355,061

Int. Cl.[4] G01N *35/06*

U.S. Cl. 436—45 20 Claims



1. A method of operating an analyzer wherein the analyzer includes a plurality of reaction locations for conducting analyses of samples, comprising the steps of:

dividing the reaction locations into a first group and a second group;

performing predetermined operations for the first and second groups during corresponding first and second processing cycles;

performing an operation that is required for selected reaction locations in both the first and second groups during only the first processing cycle, the required operation being washing the selected reaction locations in adjacent reaction locations; and

the predetermined operations including injecting samples and reagents into the reaction locations.

4,908,321

RADIO-ACTIVE METHOD FOR DETERMINING TRACE AMOUNTS OF PEROXIDE

Shambhu D. Varma, 3126 Paulskirk Dr., Ellicott City, Md. 21043

Filed Feb. 3, 1989, Ser. No. 306,526
Int. Cl.[4] G01N *23/00*; G21H *5/02*
U.S. Cl. 436—57 3 Claims

1. A method for determining the presence of peroxides in less than micromolar amounts contained in a biological and/or non-biological sample, which comprises:

(a) contacting a suspect sample with a non-volatile acid with the formula,

wherein R is an alkyl hydrocarbon or its derivative with from 1 to 6 carbon atoms;

(b) trapping liberated $^{14}CO_2$;

(c) determining liberated $^{14}CO_2$ by scintillation counting; and

(d) evaluating the results of step (c) to determine the peroxide content of said sample.

4,908,322

DERIVATIZATION OF AMINES FOR ELECTROCHEMICAL DETECTION

Kenneth A. Jacobson, Silver Spring; Kenneth L. Kirk, Bethesda; Markku I. Linnoila, Bethesda; Thomas Miller, Bethesda, and Kazunori Mine, Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 773,069, Sep. 6, 1985, abandoned. This application Dec. 27, 1988, Ser. No. 290,279
Int. Cl.[4] G01N *30/02, 30/64, 33/48*
U.S. Cl. 436—111 25 Claims

1. A process for the quantitative detection of amines in a fluid sample, comprising:

reacting a fluid sample, under a non-reactive atmosphere, with a reactive O-acyl N-hydroxysulfosuccinamide to form an N-acylated derivative of the amine to be detected, wherein said acyl group is selected so as to enhance the separability of said N-acylated amine derivative from polar substances in the remainder of the fluid which may interfere with electrochemical measuring;

separating the N-acylated amine derivative from polar substances in the remainder of the fluid sample which may interfere with electrochemical measuring; and

subjecting the separating N-acylated amine derivative to electrochemical detection coupled to high pressure liquid chromatography.

4,908,323

METHOD FOR THE DETERMINATION OF ORGANIC PEROXIDES IN ORGANIC SOLUTIONS

Wolfgang Werner, Münster, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 586,490, Mar. 5, 1984, abandoned. This application Nov. 16, 1987, Ser. No. 121,570
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307907
Int. Cl.[4] G01N *21/78*
U.S. Cl. 436—135 10 Claims

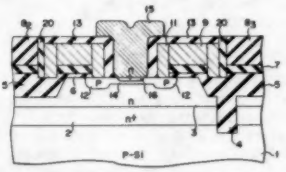
1. A method for determining organic peroxides in organic solutions comprising admixing with a sample consisting essentially of an organic peroxide in an organic solution an amount of a reagent sufficient to effect a qualitative or quantitative determination of peroxides therein, wherein said reagent consists essentially of a solution of an amount of Ti(IV) compound effective to react with peroxides to form a color, said compound having the formula TiX_4, in a C_{1-5} alcohol, wherein X is independently Cl or OR, R being a C_{1-5} alkyl group, with the proviso that if said Ti(IV) compound is $Ti(OR)_4$ said reagent solution further comprises less than about 35% by weight, relative to the total weight of the reagent solution, of a substantially non-aqueous acid having a pK_a not more than 5, the reagent being miscible with the sample to produce a homogenous phase; and determining whether any peroxide is present by correlating any resultant color with a standard.

4,908,324

METHOD OF MANUFACTURING BIPOLAR TRANSISTOR

Hiroyuki Nihira, Ayase, and Nobuyuki Itoh, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 225,804
Claims priority, application Japan, Jul. 29, 1987, 62-189419; Oct. 27, 1987, 62-269259
Int. Cl.[4] H01L *21/314, 21/225*
U.S. Cl. 437—31 19 Claims



1. A method of manufacturing a bipolar transistor, comprising the steps of:

(a) forming an insulating film on a semiconductor wafer having a collector region of a first conductivity type;

(b) depositing a first mask material film on the insulating film, and patterning said first mask material film, thereby forming a first mask material film pattern covering an internal base region prospective portion;

(c) depositing a conductive material on the surface to cover said first mask material film pattern, thereby forming a first conductive film to be used as a part of a base electrode;

(d) burying a second mask material film pattern in the surface recess of said first conductive film;

(e) selectively etching said first conductive film using said second mask material film pattern as an etching mask to expose said first mask material film pattern;

(f) continuously, selectively etching said first conductive film using said exposed first mask material film pattern and said second mask material film pattern as etching masks, thereby forming a first opening for forming an external base region between said two mask material film patterns;

(g) removing said second mask material film pattern;

(h) burying a second conductive film serving as a part of a base electrode in said first opening, while doping an impurity of a second conductivity type into said wafer through said first opening to form said external base region of the second conductivity type;

(i) removing said first mask material film pattern to form a second opening for forming an internal base region;

(j) forming a thermal oxide film on the surface of said second conductive film;

(k) doping an impurity of the second conductivity type into said wafer through said second opening to form said internal base region of the second conductivity type; and

(l) doping an impurity of the first conductivity type into said wafer through said second opening to form an emitter region of the first conductivity type in said internal base region.

4,908,325

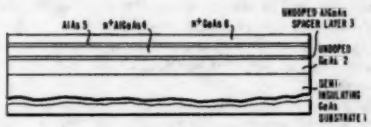
METHOD OF MAKING HETEROJUNCTION TRANSISTORS WITH WIDE BAND-GAP STOP ETCH LAYER

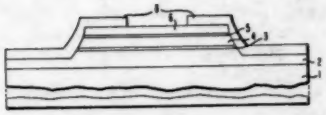
John J. Berenz, Lawndale, Calif., assignor to TRW Inc., Redondo Beach, Calif.

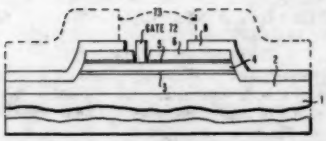
Continuation of Ser. No. 774,499, Sep. 15, 1985, abandoned. This application Nov. 9, 1988, Ser. No. 270,383

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—40 **16 Claims**







1. A method for fabricating a high electron mobility transistor, comprising:

forming a crystal layer of undoped gallium arsenide;

growing an epitaxial layer of doped aluminum gallium arsenide over said gallium arsenide layer;

terminating said foregoing aluminum gallium arsenide growing step after said aluminum gallium arsenide layer has reached a predetermined optimum thickness;

growing an epitaxial stop etch layer of aluminum arsenide over said doped aluminum gallium arsenide layer;

forming at least one overlying material layer over said stop etch layer;

etching a gate opening through said at least one overlying layer with an etchant which does not attack said stop etch layer; and

depositing a gate electrode in said gate opening.

4,908,326

PROCESS FOR FABRICATING SELF-ALIGNED SILICIDE LIGHTLY DOPED DRAIN MOS DEVICES

Di Ma, Syosset, and David H. Hoffman, Hauppauge, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Division of Ser. No. 145,390, Jan. 19, 1988, abandoned. This application Dec. 29, 1988, Ser. No. 291,492

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—44 **9 Claims**

1. A method for fabricating an MOS structure, said method comprising the steps of:

providing a silicon substrate;

prior to the definition of source and drain regions in said substrate, defining a polysilicon gate on said substrate;

depositing a first layer of a first material over said polysilicon gate and over at least a portion of the upper surface of said substrate, said first material having a different etch characteristic than said silicon substrate;

depositing a second layer of a second material having a different etch characteristic than said first material;

using said first layer of said first material as an etch stop, subjecting the structure to an etch to form a side wall spacer about said polysilicon gate;

subjecting the structure to a different etch to remove said first layer not covered by said second layer and then selectively depositing or growing additional material to a thickness less than that of said first layer, thereby to form a third layer having a thickness less than that of said first layer;

thereafter removing said second layer; and

thereafter forming source and drain regions in the upper surface of said substrate by sequentially performing a light and a heavy ion implant of an impurity of the same polarity through said remaining first and third layers.

4,908,327

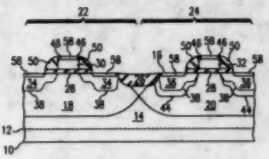
COUNTER-DOPED TRANSISTOR

Richard A. Chapman, Dallas, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed May 2, 1988, Ser. No. 189,262

Int. Cl.[4] H01L *21/265, 21/70*

U.S. Cl. 437—44 **19 Claims**



10. A method for forming a field effect transistor having lightly doped regions, comprising the steps of:

providing a substrate having a first device area and a second device area;

forming a patterned layer on said substrate;

performing a first implantation of first dopant atoms into said substrate, said first dopant atoms having a characteristic of forming regions of a first conductivity type when implanted into said substrate, said patterned layer serving as a mask to prevent implantation of said first dopant atoms in said substrate;

forming first spacer layers on at least one sidewall of said patterned layer;

forming and patterning a first masking layer on said substrate, said first masking layer protecting said second device area;

performing a second implantation of second dopant atoms into said substrate, said second dopant atoms having a characteristic of forming regions of a second conductivity type when implanted into said substrate, said patterned layer, said first masking layer and said spacer layers serving as a mask to prevent implantation of said second dopant atoms, said second dopant atoms having a higher rate of diffusion in said substrate than said first dopant atoms;

forming second spacer layers on said first spacer layers;

performing a third implantation of third dopant atoms into said substrate, said third dopant atoms having a characteristic of forming regions of said first conductivity type when implanted into said substrate, said patterned layer, said first spacer layers and said second spacer layers serving as a mask to prevent implantation of said third dopant atoms in said substrate;

forming third spacer layers on said second spacer layers;

forming and patterning a second masking layer on said substrate, said second masking layer protecting said second device area;

performing a fourth implantation of fourth dopant atoms into said substrate, said fourth dopant atoms having a characteristic of forming regions of said second conductivity type when implanted into said substrate, said patterned layer, said second masking layer and said first, second and third spacer layers serving as a mask to prevent implantation of said fourth dopant atoms, said fourth dopant atoms having a higher rate of diffusion in said substrate than said third dopant atoms;

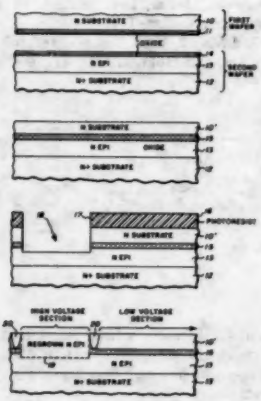
heating said substrate to diffusion said first, second, third and fourth dopant atoms into said substrate.

4,908,328

HIGH VOLTAGE POWER IC PROCESS

Chenming Hu, Alamo, and Steven P. Sapp, Felton, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 6, 1989, Ser. No. 361,894
Int. Cl.[4] H01L *21/20, 21/302*
U.S. Cl. 437—63 **8 Claims**



1. A process for forming high voltage transistors in a semiconductor wafer which will include low voltage conventional transistors, said process including the steps:

starting with a first wafer of semiconductor material having a resistivity suitable for the fabrication of said low voltage transistors and a second wafer of semiconductor material having a resistivity that is substantially lower than that of said first wafer;

forming at least one epitaxial layer of semiconductor material on one face of said second wafer;

polishing a face of said first wafer and the face of said epitaxial layer of said second wafer to produce flat mirror finishes thereon;

forming an oxide on each wafer on said polished faces;

washing said oxide coated wafer faces to render them hydrophilic;

placing said hydrophilic faces together to produce adhesion between said first and second wafers;

heating said adhered wafers to coalesce said oxide coatings thereby to join said first and second wafers into a unitary structure;

grinding and etching said exposed face of said first wafer until a predetermined thickness thereof remains;

etching a groove in said first wafer that extends through it and through said oxide that joins said wafers together to expose a portion of said epitaxial layer;

backfilling said groove with epitaxially deposited semiconductor material;

shaping the exposed surface of said first wafer for subsequent planar processing; and

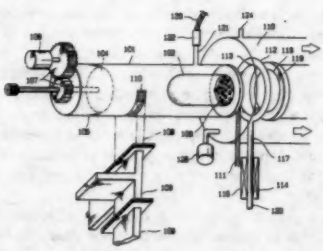
forming a high voltage transistor in said backfilled semiconductor material.

4,908,329

PROCESS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM CONTAINING GROUPS II AND VI ATOMS BY MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION PROCESS

Masahiro Kanai, Tokyo; Tsutomu Murakami, Nagahama; Takayoshi Arai, Nagahama, and Soichiro Kawakami, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,243
Claims priority, application Japan, Feb. 1, 1988, 63-21800
Int. Cl.[4] H01L *21/20*
U.S. Cl. 437—101 **10 Claims**



1. A process for the formation of a functional deposited film containing atoms belonging to the group II and VI of the periodical table as the main constituent atoms by introducing, into a film forming space for forming a deposited film on a substrate disposed therein, a compound (1) and a compound 2) represented respectively by the following general formulae (I) and (II) as the film-forming raw material and, if required, a compound (3) containing an element capable of controlling valence electrons for the deposited film as the constituent element each in a gaseous state, or in a state where at least one of such compounds is previously activated in an activation space disposed separately from said film forming space, while forming hydrogen atoms in excited state which cause chemical reaction with at least one of said compounds (1), (2) and (3) in the gaseous state or in the activated state in an activation space

different from said film forming space and introducing them into the film-forming space, thereby forming the functional deposited film on said substrate, wherein said hydrogen atoms in excited state are formed from a hydrogen gas or a gas mixture composed of a hydrogen gas and a rare gas by means of a microwave plasma generated in a plasma generation chamber disposed in a cavity resonator integrated with two impedance matching circuits in a microwave circuit and the excited state of the hydrogen atoms is controlled:

$$RnMm \quad (I)$$

$$AaBb \quad (II)$$

where m represents a positive integer equal to or multiple integer of the valence number for R, n represents a positive integer equal to or multiple integer of the valence number for M, M represents an element belonging to the group II of the periodical table, R represents a member selected from hydrogen (H), halogen (X) and hydrocarbon group, a represents a positive integer equal to or multiple integer of the valence number for B, b represents a positive integer equal to or multiple integer of the valence number for A and A represents an element belonging to the group VI of the periodical table, B represents a member selected from hydrogen (H), halogen (X) and hydrocarbon group.

4,908,330

PROCESS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM CONTAINING GROUP IV ATOMS OR SILICON ATOMS AND GROUP IV ATOMS BY MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION PROCESS

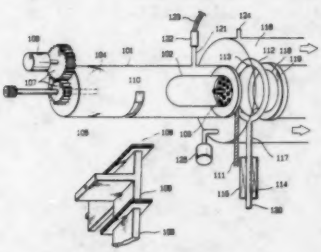
Takayoshi Arai, Nagahama; Masahiro Kanai, Tokyo; Soichiro Kawakami, and Tsutomu Murakami, both of Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,245

Claims priority, application Japan, Feb. 1, 1988, 63-21798; Feb. 1, 1988, 63-21799

Int. Cl.[4] H01L *21/14*

U.S. Cl. 437—170 **20 Claims**



1. A process for the formation of a functional deposited film containing atoms belonging to the group IV of the periodical table as the main constituent atoms by introducing, into a film forming space for forming a deposited film on a substrate disposed therein, a compound containing an element belonging to the group IV of the periodical table as the film-forming raw material and, if required, a compound containing an element capable of controlling valence electrons for the deposited film as the constituent element, each in a gaseous state, or in a state where at least one of said compounds is previously activated in an activation space disposed separately from said film forming space, while forming hydrogen atoms in excited state, which cause chemical reaction with at least one of said compounds in the gaseous state or in activated state in an activation space different from said film forming space and introducing them into the film forming space, thereby forming the deposited film on said substrate, wherein said hydrogen atoms in excited state are formed from a hydrogen gas or a gas mixture composed of a hydrogen gas and a rare gas by means of a microwave plasma generated in a plasma generation chamber disposed in a cavity resonator integrated with two impedance matching circuits in a microwave circuit and the excited state of the hydrogen atoms is controlled.

4,908,331

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY DEPOSITING METAL ON SEMICONDUCTOR MAINTAINED AT TEMPERATURE TO FORM SILICIDE

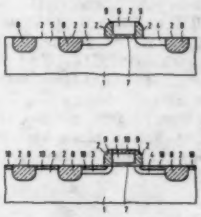
Ivo J. M. M. Raaijmakers, San Jose, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1989, Ser. No. 369,443

Claims priority, application Netherlands, Jun. 27, 1988, 8801632

Int. Cl.[4] H01L *21/285, 29/54, 29/62*

U.S. Cl. 437—187 **7 Claims**



1. A method of manufacturing a semiconductor device comprising a semiconductor body having a surface which is adjoined by regions of silicon and regions of insulating material, the regions of silicon being provided with a top layer of a metal silicide by depositing metal on the surface and heating the semiconductor body to a temperature at which the metal silicide is formed during the deposition by reaction of the metal with the silicon, characterized in that a metal cobalt or nickel is deposited on the surface, while maintaining the semiconductor body at a temperature at which cobalt or nickel disilicide is formed.

4,908,332

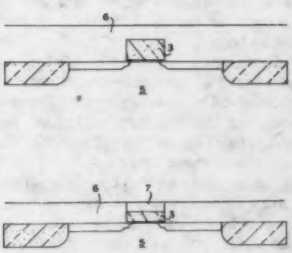
PROCESS FOR MAKING METAL-POLYSILICON DOUBLE-LAYERED GATE

Neng-Wei Wu, Hsin-Chu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, Taiwan

Filed May 4, 1989, Ser. No. 347,359

Int. Cl.[4] H01L *21/283*

U.S. Cl. 437—192 **6 Claims**



1. A process for forming a double-layered gate interconnect on a substrate, comprising:

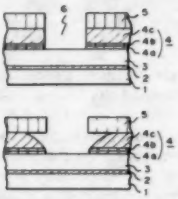
(1) forming a recess isolation structure on the substrate;
(2) forming a polysilicon gate interconnect layer on the substrate;
(3) forming source and drain regions on the substrate;
(4) depositing a planarized dielectric layer on the gate interconnect and the source and drain regions;
(5) etching back the planarized dielectric layer to the expose top surface of the polysilicon gate interconnect layer;
(6) partially etching the polysilicon gate interconnect to form a groove; and
(7) filling the groove with a metal gate interconnect layer to abut the polysilicon gate interconnect layer to form a double-layered gate interconnect.

4,908,333

PROCESS FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A CONTACT WINDOW DEFINED BY AN INCLINED SURFACE OF A COMPOSITE FILM

Kimiaki Shimokawa, and Hiroshi Hoga, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 168,315
Claims priority, application Japan, Mar. 24, 1987, 62-67934
Int. Cl.[4] H01L *21/285, 21/318*
U.S. Cl. 437—195 **4 Claims**



1. A method of manufacturing a semiconductor device, said method comprising:

providing a semiconductor substrate;

forming a composite film, having an index of refraction that varies serially over the thickness thereof, over a surface of the semiconductor substrate, said composite film consisting of a lower film of silicon nitride having a first refractive index, a middle film of silicon nitride having a refractive index that increases over the thickness thereof in a direction toward the lower film, and an upper film of silicon nitride-oxide having a refractive index that increases over the thickness thereof in a direction toward the middle layer;

forming a photoresist in a pattern over the insulating film;

forming a contact window extending through the composite film and defined by a vertically extending sidewall thereof by subjecting the structure formed by performing the preceding steps to a reactive ion etching process in which the photoresist is used as a mask;

exposing the structure formed by performing the preceding steps to an etchant capable of etching the composite film so as to etch the vertically extending sidewall into an inclined surface due to the variation in the index of refraction of the insulating film;

removing the photoresist; and

forming a conductive film over the composite film including the inclined surface thereof and over a surface of the substrate exposed at the bottom of the contact window.

4,908,334

METHOD FOR FORMING METALLIC SILICIDE FILMS ON SILICON SUBSTRATES BY ION BEAM DEPOSITION

Raymond A. Zuhr, and Orin W. Holland, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 24, 1989, Ser. No. 300,863
Int. Cl.[4] H01L *21/24, 21/265, 21/283*
U.S. Cl. 437—200 **6 Claims**

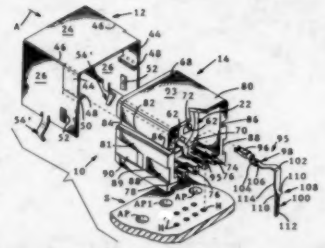
1. A method for forming a film of metallic silicide of essentially uniform stoichiometry on the surface of a silicon substrate, comprising the steps of contacting an exposed surface of a silicon substrate with a beam of metal ions for depositing metal ions on the surface of the substrate, with said ions being at an energy level sufficiently low to substantially minimize metal ion loss by sputtering upon said contact and to effect penetration by said metal ions into the surface of the silicon substrate to a maximum depth of less than about 2 nm, heating the silicon substrate during the contacting thereof with the beam of metal ions to a temperature sufficient to effect diffusion of silicon atoms from said substrate to contact the metal ions as they are being deposited on said surface to essentially athermally interact therewith for continuously forming a film of metallic silicide on the surface of said silicon substrate, and maintaining said contacting of said surface with said metal ions and said heating of the substrate to continue the diffusion of silicon atoms through formed portions of said film and thereby continue the metallic-silicide forming interaction for a duration sufficient to provide said film of the metallic silicide on the surface of the silicon substrate with a thickness in the range of about 1 to 300 nm.

4,908,335

ONE-PIECE MOLDED INSULATING HOUSING FOR A CIRCULAR DIN CONNECTOR

Pete Cosmos, Mechanicsburg; Benjamin H. Mosser, III, Middletown, and William C. Ohl, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 202,727, Jun. 3, 1988, abandoned. This application Jul. 11, 1989, Ser. No. 379,653
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—79 **17 Claims**



1. A one piece molded insulating housing for a shielded electrical connector, the housing comprising:

a circular cross-section, elongate, plug portion having at one end thereof a mating face, a plurality of terminal receiving parallel cavities, extending through said plug portion axially thereof and each having a pin receiving mouth opening into said mating face;

a substantially rectangular cross-section connector body formed integrally with the other end of the plug portion and from which projects, forwardly, a hood surrounding said plug portion in spaced relationship therewith, to allow a circular cross-section, electrical socket to be mated with said plug portion, said body having a terminal receiving face opposite to said mating face, each of said

cavities extending through said body and having a terminal receiving mouth opening into said terminal receiving face, a protective skirt extending rearwardly from the periphery of said terminal receiving face and having a rear edge, each of two opposite sides of said body being formed with an external groove opening into a forward edge of said hood having a deepened part proximate to said rear edge; and

a terminal leg spacer plate projecting from said terminal receiving face along one edge thereof in a direction away from said plug portion, a plurality of elongate, terminal leg receiving, spacer notches, each extending normally of said terminal receiving face and opening into an edge of said spacer plate remote from said terminal receiving face each for the retention of a terminal leg therein; and a metal shield slidable onto said body and having a flange for slidable reception in each groove and being engageable in the deepened part thereof with a snap action.

4,908,336

FLEXIBLE CIRCUIT AND CONNECTOR ASSEMBLY

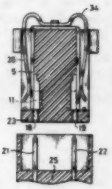
Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Mar. 30, 1989, Ser. No. 330,874

Claims priority, application Netherlands, Mar. 31, 1988, 8800839

Int. Cl.[4] H01R *13/04*

U.S. Cl. 439—496 **9 Claims**



1. A flexible circuit assembly provided with at least one connector for connecting an electrical component to corresponding conductors of a flexible circuit comprising a connector having two contact strips formed on insulating flexible material which are attached to the flexible circuit and which extend essentially parallel to each other and have, on the surfaces facing each other, electrical contact surfaces which are electrically connected to the corresponding conductors of the flexible circuit, a positioning block which is made of insulating material and is provided with holes into which connecting pins of an electrical component can be inserted, said block including grooves in which the contact strips lie, said grooves being provided in the sides of the positioning block adjacent by said holes, said grooves having a depth which is greater than the minimum distance between the wall of a hole and the adjacent side of the positioning block, and a clamping spring which presses the contact strips towards each other.

4,908,337

FOIL FOR SOLDERING THE TERMINALS OF AN ELECTRONIC COMPONENT

Frank Treffer, Mainz, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

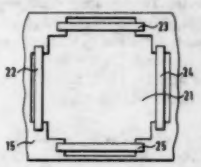
Filed Apr. 4, 1988, Ser. No. 176,840

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714694

Int. Cl.[4] H01R *43/00*

U.S. Cl. 439—876 **5 Claims**

1. A foil with strips of solder disposed on the soil, the strips of solder being positioned for soldering terminals of electronic components to conductive paths on a board which supports the electronic components, the foil being formed with cutouts, the cutouts being bridged over by the strips of solder; and wherein



the cutouts are configured to expose a plurality of the conductive paths to the strips of solder upon an emplacement of the foil upon the board with the cutouts in registration with said terminals.

4,908,338

DRIED EMULSION CERAMIC PROCESS

Sidney D. Ross, Williamstown; Galeb H. Maher, North Adams, both of Mass., and Clinton E. Hutchins, Pownal, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 947,117, Dec. 29, 1986, Pat. No. 4,749,664. This application May 20, 1988, Ser. No. 196,515

Int. Cl.[4] C04B *35/00*

U.S. Cl. 501—1 **3 Claims**

1. A dried emulsion process for introducing an additive, selected from the group consisting of cadmium zinc borate, niobium pentoxide, manganese oxide, and bismuth oxide, into fine powder ceramic multi-layer capacitor materials, said process comprising:

forming an aqueous solution of precursors of said additive;

forming an emulsion of a surfactant, a waterimmiscible fluid, and a dispersion of droplets of said solution;

distilling water and said fluid from said emulsion so as to result in a dried emulsion of said precursors; and

introducing an amount greater than 0% and up to 5% by weight of said dried emulsion into fine powder ceramic materials.

4,908,339

FLEXIBLE GLASS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 57,810, Jun. 1, 1987, Pat. No. 4,824,807. This application Apr. 18, 1989, Ser. No. 339,667

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] C03C *3/04*

U.S. Cl. 501—32 **10 Claims**

1. A flexible alkali metal silicate glass-polymerized organic compound product produced by the following steps:

(a) mixing 10 to 80 parts by weight of alkali metal glass having a SiO_2:alkali metal oxide ratio of 3.9:1 to 2.0:1 with 50 to 100 parts by weight of water until an aqueous alkali metal silicate glass suspension is produced;

(b) admixing up to 300 percent by weight, based on weight of the aqueous alkali metal silicate glass suspension, of a polymerizable organic compound selected from the group consisting of vinyl monomers, diene monomers and mixtures thereof;

(c) admixing and reacting up to 10 percent by weight, based on the weight of the aqueous alkali metal silicate glass suspension, of a free-radical initiator;

(d) thereby producing an aqueous alkali metal silicate glass-polymerized organic compound suspension;

(e) pouring or applying the aqueous alkali metal silicate glass-polymerized organic compound suspension into the desired form;

(f) drying out water from the aqueous alkali metal silicate glass-polymerized organic compound suspension.

4,908,340

NON-OXIDE SINTERED CERAMIC FIBERS

Francis J. Frechette, Tonawanda; Wolfgang D. G. Boecker, Lewiston; Carl H. McMurtry, Youngstown, and Martin R. Kasprzyk, Ransomville, all of N.Y., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 16, 1987, Ser. No. 74,080
Int. Cl.[4] C04B *35/02, 35/80*
U.S. Cl. 501—95 30 Claims

1. A high temperature polycrystalline ceramic fiber consisting essentially of non-oxide ceramic materials, said fiber having a diameter of between 1 and 200 microns, said fiber being stable in an inert atmosphere at a temperature above about 1700° C., said fiber comprised of a sintered ceramic powder having a maximum particle size less than the diameter of the fiber, said ceramic powder also being stable in an inert atmosphere at a temperature above about 1700° C., at least 90% of said ceramic material in said fiber consisting of non-oxide borides, nitrides, carbides and silicides of aluminum, boron, chromium, hafnium, molybdenum, niobium, silicon, tantalum, titanium, tungsten, vanadium and zirconium, said fiber having a smooth surface, said fiber having a roundness of greater than 1.15.

4,908,341

METHOD FOR REACTIVATING SPENT CATALYST BY CONTACT WITH ONE OR MORE AROMATIC COMPOUNDS

Ann L. Pruden, Bellemead; Chaya Venkat, Princeton, and Darrell D. Whitehurst, Titusville, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 937,951, Dec. 4, 1986, abandoned. This application Oct. 20, 1987, Ser. No. 110,318
Int. Cl.[4] B01J *29/38, 38/58, 38/56;* C10G *47/20*
U.S. Cl. 502—30 27 Claims

1. A method for regenerating a spent porous crystalline zeolite catalyst which comprises contacting the spent catalyst, which has become deactivated by accumulation of carbonaceous residue during dewaxing, with one or more light aromatic compounds at temperature between 700° F. to 1200° F. under conditions resulting in reactivation of said catalyst, said light aromatic compound having a boiling point not higher than about 220° C. and the capability of penetrating the catalyst, so as to contact the carbonaceous residue contained therein, undergoing alkylation by alkyl fragments contributed by components of the carbonaceous residue and diffusing from or otherwise escaping the catalyst.

4,908,342

ZSM-5 ZEOLITES HAVING UNIFORMLY LARGE CRYSTALS

John P. McWilliams, Woodbury, and Catherine T. Sigal, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 773,101, Sep. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 647,501, Sep. 5, 1984, abandoned. This application Mar. 3, 1987, Ser. No. 18,747
Int. Cl.[4] B01J *29/28*
U.S. Cl. 502—68 7 Claims

1. A catalyst composition comprising an extrudate of zeolite crystallites and a binder, said crystallites being ZSM-5 crystallites having an average minimum dimension of greater than 3 microns with a size variation of no more than 25 percent in terms of relative standard deviation.

2. A catalyst composition according to claim 1, wherein said binder is clay.

3. A catalyst composition according to claim 1, wherein said binder is selected from the group consisting of alumina, silica, silica-alumina, silica-magnesia, silica-zirconia, silica-thoria, silica-beryllia, silica-titania, silica-alumina-thoria, silica-alumina-zirconia, silica-alumina-magnesia and silica-magnesia-zirconia.

4,908,343

CATALYST COMPOSITION FOR OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

Madan M. Bhasin, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 18,809, Feb. 20, 1987, abandoned, which is a continuation of Ser. No. 640,269, Aug. 13, 1984, abandoned. This application Oct. 3, 1988, Ser. No. 251,573
Int. Cl.[4] B01J *23/02, 23/04, 23/50*
U.S. Cl. 502—218 44 Claims

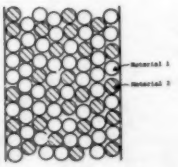
1. A catalyst for the manufacture of ethylene oxide by the epoxidation of ethylene containing an impregnated silver metal on an inert, refractory solid support and an efficiency-enhancing amount, relative to the amount of silver metal, of a mixture of (i) a cesium salt of an oxyanion of an element selected from Groups 3through 7*b* inclusive, of the Periodic Table of the Elements, and (ii) at least one of an alkali metal salt of lithium, sodium, potassium and rubidium and an alkaline earth metal salt, in which the anions of such salts are halides of atomic numbers of 9 to 53, inclusive, and oxyanions of elements other than the oxygen therein having an atomic number of 7 or 15 to 83, inclusive, and selected from Groups 3*a* to 7*a*, inclusive, and 3*b* through 7*b*, inclusive, of the periodic Table of the Elements.

4,908,344

HYDROPROCESSING CATALYST AND SUPPORT HAVING BIDISPERSE PORE STRUCTURE

Carmo J. Pereira, and Wu-Cheng Cheng, both of Columbia, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 859,104, May 2, 1986, abandoned. This application Jul. 8, 1987, Ser. No. 71,128
Int. Cl.[4] B01J *23/88, 23/85, 23/16, 21/12*
U.S. Cl. 502—313 10 Claims



1. A hydrotreating catalyst having a bidisperse micropore size distribution comprising

a catalyst support made of a refractory oxide formed particle made of two different micropore size materials having

(a) one small pore material being characterized as having a small micropore region having an average pore diameter of less than 100 Angstrom units; and

(b) another material being characterized as having a large micropore region having an average pore diameter

(i) which is less than 600 Angstrom units,

(ii) which is equal to or larger than 100 Angstrom units, and

(iii) which is much larger than the average diameter of the metal bearing molecules in heavy feed to be processed;

the pore volume of the large micropore region comprising 10 to 90% of the total pore volume; and the pore volume of the small micropore region comprising 10 to 90% of the total pore volume; and

one or more catalytic metal components deposited on the support being selected from the group consisting of the metals belonging to groups VB, VIB, VIIB and VIII of the Periodic Table, said catalytic metal components being present in an amount of between about 0.1% and about

30% in terms of metal oxide based on the total weight of said catalyst.

4,908,345

DYE RECEIVING

Noritaka Egashira, Ichikawa, and Hitoshi Arita, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

PCT No. PCT/JP87/00439, § 371 Date Apr. 11, 1988, § 102(e) Date Apr. 11, 1988, PCT Pub. No. WO88/00139, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 30, 1987, Ser. No. 163,757

Claims priority, application Japan, Jun. 30, 1986, 61-152925; Jun. 30, 1986, 61-152926; Jun. 30, 1986, 61-152927

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **25 Claims**

25. A method of imaging a dye receiving sheet, comprising:

providing a heat transfer sheet comprising a dye layer containing a fusible or sublimable dye;

providing a dye receiving sheet comprising a sheet substrate and a dye receiving layer comprising a modified polyester resin synthesized by the use of a polyol component having a phenyl group and a dicarboxylic acid having a long chain methylene group;

contacting the dye layer of said heat transfer sheet to the dye receiving layer of said dye receiving sheet; and

heating the contacting sheets to transport said fusible or sublimable dye from the dye layer of said heat transfer sheet to the dye receiving layer of said dye receiving sheet.

4,908,346

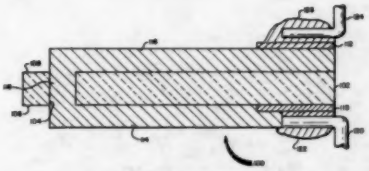
CRYSTALLINE RARE EARTH ALKALINE EARTH COPPER OXIDE THICK FILM CIRCUIT ELEMENT WITH SUPERCONDUCTING ONSET TRANSITION TEMPERATURE IN EXCESS OF 77%

Lauri A. Strom; Edward Carnall, Jr.; Steven A. Ferranti, all of Rochester, and Jose M. Mir, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1987, Ser. No. 68,391

Int. Cl.[4] H05K *1/00, 1/16;* **B32B** *3/00, 7/02*

U.S. Cl. 505—1 **16 Claims**



16. A circuit element comprising

an insulative substrate presenting first and second parallel major surfaces,

a first means for providing a conductive path between at least two locations on the first major surface including a thick film conductor having a thickness of at least 5 μm,

a second means for providing a conductive path between at least two locations on the second major surface including a thick film conductor, and

a third means for providing a conductive path between the first and second conductive path means,

characterized in that

the first means is comprised of a crystalline rare earth alkaline earth copper oxide which exhibits a superconducting onset transition temperature in excess of 77° K. and is comprised of a $R_1A_2C_3$ crystalline phase and

the substrate is chosen from the class consisting of strontium titanate, magnesia, alumina, and aluminum nitride.

4,908,347

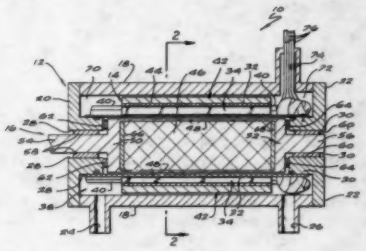
DYNAMOELECTRIC MACHINE WITH DIAMAGNETIC FLUX SHIELD

Joseph Denk, Manhattan Beach, Calif., assignor to Allied-Signal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 107,150, Oct. 9, 1987, which is a division of Ser. No. 800,184, Nov. 20, 1985, Pat. No. 4,709,180. This application Jul. 7, 1988, Ser. No. 217,729

Int. Cl.[4] H02K *9/00*

U.S. Cl. 505—1 **14 Claims**



8. A dynamoelectric machine comprising:

a rotor means for producing a high strength magnetic field;

at least one stator winding disposed about said rotor means;

means for supporting said stator winding, said means for supporting formed of non-magnetic material;

a substantially cylindrical flux shield means of superconducting diamagnetic materials, mounted around said stator winding and said means for supporting, for containing the magnetic field produced by said rotor means internally to said flux shield means;

a housing for containing said rotor means, said stator winding, said means for supporting, and said flux shield means;

a winding lead conductor attached to said stator winding and adapted to be connected to an electrical device external to said housing; and

a power coupling shaft connected to said rotor means and adapted to be coupled with a mechanical device external to said housing.

4,908,348

BARRIER LAYER ARRANGEMENT FOR CONDUCTIVE LAYERS ON SILICON SUBSTRATES

Liang-Sun Hung, and John A. Agostinelli, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,699

Int. Cl.[4] B32B *9/00*

U.S. Cl. 505—1 **17 Claims**

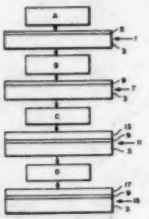
1. A circuit element comprised of a silicon substrate and a conductive layer located on the substrate,

characterized in that

the conductive layer consists essentially of a rare earth alkaline earth copper oxide and

a barrier layer triad is interposed between the silicon substrate and the conductive layer comprised of a first triad layer located adjacent the silicon substrate consisting essentially of silica, a third triad layer remote from the silicon substrate consisting essentially of a least one Group

4 heavy metal oxide, and a second triad layer interposed between the first and third triad layers consisting essen-



tially of a mixture of silica and at least one Group 4 heavy metal oxide.

4,908,349

BICYCLIC ALDEHYDES AND FRAGRANCE COMPOSITIONS CONTAINING SAME

Hans-Ulrich Gonzenbach, Geneva, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Jul. 14, 1988, Ser. No. 219,018

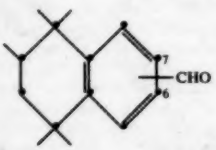
Claims priority, application Switzerland, Jul. 29, 1987, 2892/87

Int. Cl.[4] A61K 7/46; C07C 47/52

U.S. Cl. 512—26 **6 Claims**

1. A compound of the formula

I



wherein the group —CHO is a substituent on either the carbon atom designated by the number 6 or on the carbon atom designated by the number 7.

4,908,350

HYPEROSMOTIC/HYPERONCOTIC SOLUTIONS FOR RESUSCITATION OF HYPODYNAMIC SHOCK

George C. Kramer, Davis, and James W. Holcroft, El Macero, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 793,573, Oct. 31, 1985, abandoned. This application Feb. 24, 1988, Ser. No. 163,137

Int. Cl.[4] A61K 37/02, 33/14, 31/70

U.S. Cl. 514—2 **20 Claims**

1. A physiologically acceptable solution for treating hypodynamic circulatory shock in a mammal, said solution containing a crystalloid having a molecular weight less than about 1000 in a concentration of at least about 1800 mOsms and a colloid having a molecular weight in excess of 30,000 in a concentration so as to render said solution hyperoncotic relative to the colloidal osmotic pressure of the normal blood plasma of said mammal.

4,908,351

ANTIBIOTIC A 42867 DERIVATIVE

Ernesto Riva; Maurizio Denaro, both of Milano; Pietro Ferrari, Ferriere, and Giovanni Cassani, Pavia, all of Italy, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jan. 24, 1989, Ser. No. 304,421

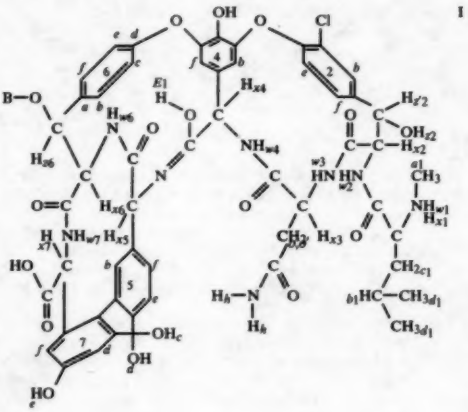
Claims priority, application United Kingdom, Jan. 28, 1988, 8801899

Int. Cl.[4] A61K 37/02; C07K 5/12

U.S. Cl. 514—8 **11 Claims**

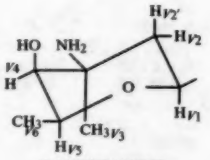
1. Antibiotic A 42867 pseudoaglycon and the pharmaceutically acceptable salts thereof having the following the formula (unsalified compound):

I



wherein

B represents a beta-vancosamine unit of formula



VANCOSAMINE
(β anomer)

and the tautomers thereof.

4,908,352

UROTENSIN PEPTIDES

Karl P. Lederis; Denis McMaster, both of Calgary, Canada, and Jean E. F. Rivier, LaJolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Sep. 28, 1987, Ser. No. 101,580

Int. Cl.[4] A61K 37/00; C07K 7/10

U.S. Cl. 514—12 **9 Claims**

1. A substantially pure urotensin polypeptide having the formula: Y-R_1-Pro-Pro-Met-Ser-Ile-Asp-Leu-Thr-Phe-His-Met-Leu-Arg-Asn-Met-Ile-His-Arg-Ala-Lys-Met-Glu-Gly-Glu-Arg-Glu-Gln-Ala-Leu-Ile-Asn-Arg-Asn-Leu-Leu-Asp-Glu-Val-NH_2 or a biologically active fragment thereof, wherein Y is an acyl group having 7 or less carbon atoms or hydrogen and R_1 is Ser-Glu-Glu or Glu-Glu or Glu or des-R_1; or a nontoxic addition salt thereof.

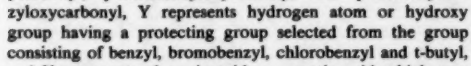
4,908,353

NOVEL DIPEPTIDE USEFUL AS A PLANT GROWTH REGULATOR

Atsushi Yamamoto; Kazuharu Ienaga; Kunihiko Higashiura, and Masaharu Kurohashi, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 14, 1988, Ser. No. 257,605
Claims priority, application Japan, Oct. 16, 1987, 62-262437
Int. Cl.[4] A61K *37/02*; C07K *5/06*
U.S. Cl. 514—19 8 Claims

1. A dipeptide having the formula (I):



(I)

wherein R represents a hydrogen atom or an amino-protecting group selected from the group consisting of t-butoxycarbonyl, t-pentoxycarbonyl, benzyloxycarbonyl, o-chlorobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl and p-methoxybenzyloxycarbonyl, Y represents hydrogen atom or hydroxy group having a protecting group selected from the group consisting of benzyl, bromobenzyl, chlorobenzyl and t-butyl, and X represents glutamic acid or aspartic acid which may optionally have at least one protecting group selected from the group consisting of benzyloxy, p-methoxybenzyloxy, t-butoxy, t-pentoxy, cyclopentyloxy, cyclohexyloxy and piridiloxy;
and pharmaceutical acceptable salts thereof.

4,908,354

PROCESS FOR THE SELECTIVE EXTRACORPOREAL PRECIPITATION OF LOW-DENSITY LIPOPROTEINS

Dietrich Seidel, Göttingen; Heinrich Wieland, Freiburg; Gerhard Rosskopf, Fuldabrück-Dörnhagen, and Wolfgang Feller, Melsungen-Obermelsungen, all of Fed. Rep. of Germany, assignors to B. Braun-SSG AG, Emmenbrucke, Switzerland

Continuation of Ser. No. 744,199, Jun. 13, 1985, abandoned.
This application Nov. 20, 1987, Ser. No. 124,394
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422407
Int. Cl.[4] C07K *15/16*; A61K *37/02*
U.S. Cl. 514—21 15 Claims

1. A method for the therapeutic treatment of a patient by the substantially selective precipitation of low density lipoproteins without the use of polyvalent cations which comprises administering to a volume of blood, plasma, or a solution of blood or plasma of the patient a low-density lipoprotein precipitating substance other than heparin having a coagulation activity greater than about 1 IU/mg at a pH between about 4 and 5.8 such that an anticoagulent effect associated with heparin is minimized or eliminated.

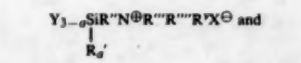
4,908,355

SKIN TREATMENT METHOD

Richard L. Gettings, Freeland, and William C. White, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 9, 1989, Ser. No. 294,724
Int. Cl.[4] A61K *31/695*
U.S. Cl. 514—63 7 Claims

1. A method of treating acne vulgaris comprising applying topically to the epidermis a mixture of an antibacterially effective amount of a silane and a water immiscible liquid, the silane being an organosilicon quaternary ammonium compound and an organosilane having the formula selected from the group consisting of



and

-continued

wherein, in each formula,
Y is R or RO where each R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;
a has a value of 0, 1 or 2; R′ is a methyl or ethyl radical;
R″ is an alkylene group of 1 to 4 carbon atoms;
R‴, R⁗ and R^{v} are each independently selected from a group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and R^{vi} is a perfluoroalkyl radical having from 1 to 12 carbon atoms; and
X is chloride, bromide, fluoride, iodide, acetate or tosylate, the water immiscible liquid being a polysiloxane having the formula $(R'R''SiO)_y$ wherein R′ is an alkyl radical of 1 to 3 carbon atoms; R″ is an alkyl radical of 1 or 2 carbon atoms; and y has a value of 3 to 5.

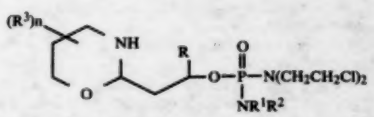
4,908,356

ALDOPHOSPHAMIDE DERIVATIVES USEFUL AS ANTITUMOR AGENTS

Richard F. Borch, Pittsford, and Ronald R. Valente, Rochester, both of N.Y., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed May 25, 1988, Ser. No. 198,429
Int. Cl.[4] A61K *31/535*; C07D *265/06*
U.S. Cl. 514—90 19 Claims

1. A compound of the formula



wherein R^1 and R^2 may be the same of different and are each independently hydrogen or lower alkyl which may be unsubstituted or monosubstituted with halogen or lower alkoxy or hydroxy with the proviso that the substituent is not on the α-carbon or R_1 and R_2 together with nitrogen to which they are attached from a morpholino ring;
each R^3 is independently hydrogen, lower alkyl, carboxy or carbalkoxy;
n is an integer from 0, 1, 2 or 3 and
R is hydrogen, lower alkyl, cycloalkyl, arylalkyl aryl or a nitrogen, sulfur or oxygen containing heterocyclic or a heterocyclic lower alkyl and pharmaceutically acceptable salts thereof.

19. A pharmaceutical composition comprising an effective amount of a compound according to claim 1 and a pharmaceutical carrier thereto.

4,908,357

PHOTOACTIVE AZOLE PESTICIDES

Kathryn A. Lutomski, Hightstown, N.J., assignor to FMC Corporation, Philadelphia, Pa.

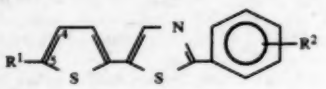
Continuation-in-part of Ser. No. 34,259, Apr. 2, 1987, Pat. No. 4,791,124, which is a continuation-in-part of Ser. No. 908,754, Sep. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 857,883, Apr. 30, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 247,974

The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.[4] A01N *43/78, 57/24;* C07D *417/04;* C07F *9/65*

U.S. Cl. 514—92 4 Claims

1. A compound of the formula



in which

(a) R^1 is lower alkoxycarbonyl, lower haloalkyl, lower alkylcarbonyl, lower haloalkoxycarbonyl, phenoxycarbonyl in which the phenyl ring is unsubstituted or is substituted with at least one substituent selected from the group consisting of lower alkyl, halogen and trifluoromethyl, [1,1-biphenyl]methyloxycarbonyl, phenylthio, lower haloalkylsulfonyl, phenylsulfonyl, nitro, cyano, a group of the formula $—C(X)NR^3R^4$ in which R^3 and R^4 are selected from the group consisting of hydrogen and lower alkyl and X is selected from oxygen and sulfur, a group of the formula $—P(X)(R^5)_2$ in which R^5 is selected from the group consisting of lower alkoxy and lower alkylthio, or a group of the formula $—C{\equiv}C—R^6$ in which R^6 is selected from the group consisting of lower alkyl, lower haloalkyl, phenyl and phenyl substituted with lower alkyl or halogen; and R^2 is at least one substituent selected from lower haloalkyl, lower haloalkylthio, phenylthio, nitro, cyano, lower alkylcarbonyl, lower alkoxycarbonyl, and di(lower-)alkoxyphosphonyl;

(b) R^1 is halogen or lower alkyl and R^2 is as defined in (a) above but is other than haloalkyl;

(c) R^1 is $—CH{=}CH—CH{=}CH—$ bridging positions 4 and 5 of the thienyl ring and R^2 is selected from hydrogen, lower alkyl, one to three halogen atoms, lower haloalkyl, or lower haloalkoxy; or

(d) R^1 is as defined in (a) above but is other than alkoxycarbonyl and R^2 comprises at least one substituent selected from halogen, lower alkyl, lower haloalkoxy, and a group of the formula $—O—CF_2—O—$ bridging adjacent carbon atoms of the phenyl ring.

2. The compound of claim 1 in which R^2 is trifluoromethyl or trifluoromethylthio.

4. A method for controlling insects or acarids which comprises applying to the locus where control is desired an insecticidally or acaricidally effective amount of a compound of claim 1 or 2.

4,908,358

INHIBITION OF IMMUNE CLEARANCE USING PROGESTERONE ANALOGUES

Alan D. Schreiber, Philadelphia, Pa., assignor to Trustees of The University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 89,790, Aug. 27, 1987. This application Feb. 24, 1988, Ser. No. 159,706

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—177 4 Claims

1. A method of inhibiting the clearance of antibody-coated red blood cells from the circulation of a mammal comprising administering to a mammal exhibiting undesired clearance of antibody-coated cells an amount of 5-alphapregnan-3,20-dione effective to inhibit clearance of antibody-coated cells.

4,908,359

1-DETHIA-2-THIA-CEPHALOSPORANIC ACIDS

Germain Costerousse, Saint-Maurice; Solange Gouin d'Ambrieres, Paris, and Jean-Georges Teutsch, Pantin, all of France, assignors to Roussel Uclaf, Paris, France

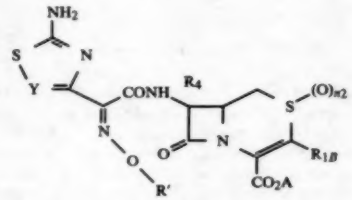
Filed Feb. 8, 1988, Ser. No. 153,148

Claims priority, application France, Feb. 6, 1987, 87 01457

Int. Cl.[4] C07D *417/12;* A61K *31/54*

U.S. Cl. 514—210 15 Claims

1. A compound selected from the group consisting of 1-dethia-2-thia-cephalosporanic acids of the formula



wherein R′ is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl and alkynyl of 2 to 6 carbon atoms, and cycloalkyl of 3 to 6 carbon atoms substituted or unsubstituted with at least one member of the group consisting of halogen, carboxy, salified carboxy, esterified carboxy, alkoxy, oxo, alkylthio, mercapto, hydroxy, amino, nitro, carbamoyl and cyano, n_2 is 0, 1 or 2, R_4 is hydrogen or methoxy, R_{1B} is $—(CH{=}CH)_{n1}—CH_2—S—R_m$, n_1 is 0, 1 or 2, R_m is an unsaturated group including a positively charged and double bonded nitrogen atom, the said group being bonded to the sulfur atom through a carbon atom and selected from the group consisting of pyridyl, pyrrolyl, oxazolyl, thiazolyl, imidazolyl, pyrazolyl, triazolyl, tetrazolyl, pyridazinyl, pyrimidinyl, pyrazinyl, quinoleinyl, isoquinoleinyl, cinnolinyl, quanazolinyl, pyridino pyrimidinyl, dihydro- or tetrahydropyridyl, unsubstituted or substituted by at least one member selected from the group of alkyl of 1 to 4 carbon atoms, methoxy, ethoxy, halogen, carboxyalkyl, esterified carboxyalkyl, carbamoyl, thioacetylalkyl, thiocarbamoylalkyl, haloalkyl, cyanoalkyl and alkenyl of 2 to 4 carbon atoms Y is methine or nitrogen and A is selected from the group consisting of hydrogen, alkali metal ion, or alkaline earth metal ion, magnesium ion, ammonium ion, an organic amine base and an ester group or —COOA is $—COO^-$ and their non-toxic, pharmaceutically acceptable acid addition salts.

4,908,360

1-AMINOALKYL-3-OXYSUBSTITUTED-4-ARYL-1,3,4,5-TETRAHYDRO-2H-1,3-BENZODIAZEPINE-2-ONES

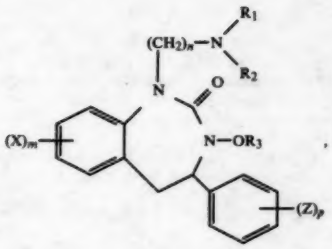
Lawrence L. Martin, Lebanon, and Joseph F. Payack, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Nov. 14, 1988, Ser. No. 270,335

Int. Cl.[4] A61K *31/55;* C07D *243/04*

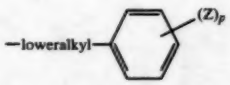
U.S. Cl. 514—213 16 Claims

1. A compound of the formula



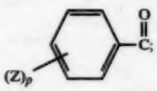
where R_1 and R_2 are each independently hydrogen, loweralkyl, aryl, of the formula

aryloweralkyl of the formula

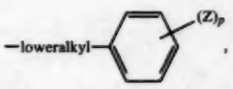


and acyl of the formula loweralkyl

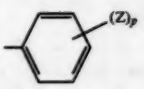
or of the formula



R_3 is hydrogen, loweralkyl, aryloweralkyl of the formula

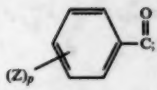


aryl of the formula



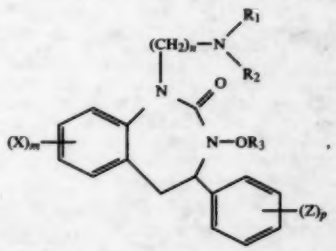
and acyl of the formula

or of the formula

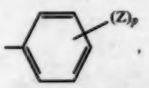


X and Z are independently hydrogen, halogen, hydroxy, loweralkyl, loweralkoxy, NO_2, NH_2 and CF_3, m is an integer of 1 to 3; n is an integer of 1 to 3; p is an integer of 1 to 3; and the pharmaceutically acceptable acid addition salts thereof and where applicable the individual geometric and optical isomers thereof and racemic mixtures thereof.

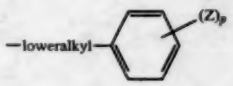
16. A method of reducing blood pressure in a mammal which comprises administering to a mammal an effective blood pressure reducing amount of a compound of the formula



where R_1 and R_2 are each independently hydrogen, loweralkyl, aryl of the formula

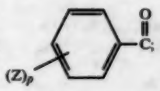


aryloweralkyl of the formula

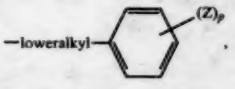


and acyl of the formula loweralkyl

or of the formula



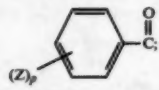
R_3 is hydrogen, loweralkyl, aryloweralkyl of the formula



aryl of the formula

and acyl of the formula loweralkyl

or of the formula



X and Z are independently hydrogen, halogen, hydroxy, loweralkyl, loweralkoxy, NO_2, NH_2 and CF_3, m is an integer of 1 to 3; n is an integer of 1 to 3; p is an integer of 1 to 3; and the pharmaceutically acceptable acid addition salts thereof and where applicable the individual geometric and optical isomers thereof and racemic mixtures thereof.

4,908,361

TETRAHYDROISOQUINO(2,1-C)(1,3)BENZODIAZEPINES

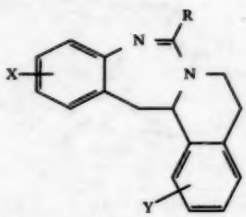
Lawrence L. Martin, Lebanon, and Richard C. Allen, Flemington, both of N.J., assignors to Hoechst-Roussel Incorporated, Somerville, N.J.

Filed Apr. 28, 1989, Ser. No. 344,799

Int. Cl.[4] C07D *453/00*; A61K *31/55*

U.S. Cl. 514—219 **11 Claims**

1. A compound of the formula



where X and Y are independently hydrogen, halogen, loweralkyl, loweralkoxy or —CF_3 and R is hydrogen or loweralkyl; and the pharmaceutically acceptable acid addition salts thereof and where applicable the optical isomers and racemic mixtures thereof.

4,908,362

SALT OF A SUBSTITUTED MORPHOLINE WITH FLUOBORIC ACID, FUNGICIDAL COMPOSITION AND USE

Reimer Goettsche, Baden-Baden, and Hans-Norbert Marx, Buehl-Weitenung, both of Fed. Rep. of Germany, assignors to Dr. Wolman GmbH, Sinzheim, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,376

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605007

Int. Cl.[4] A01N *43/84*; C07D *265/30*

U.S. Cl. 514—231.2 **4 Claims**

1. The salt of N-tridecyl-2,6-dimethylmorpholine with fluoboric acid.

4. A method of controlling fungi, wherein the fungi or the materials threatened by fungi attack are treated with the salt of N-tridecyl-2,6-dimethylmorpholine with fluoboric acid.

4,908,363

IMIDAZOLE DERIVATIVES

Wilhelm Klötzer, Innsbruck; Renate Müssner, Nendeln, both of Austria; Marc Montavon, Basel, Switzerland, and Nicolas Singewald, Innsbruck, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

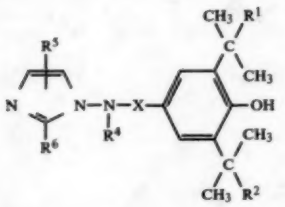
Filed Mar. 15, 1988, Ser. No. 169,207

Claims priority, application Switzerland, Mar. 20, 1987, 1073/87

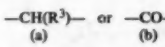
Int. Cl.[4] A61K *31/415*; C07D *401/04, 233/88*

U.S. Cl. 514—235.8 **26 Claims**

1. A compound of the formula

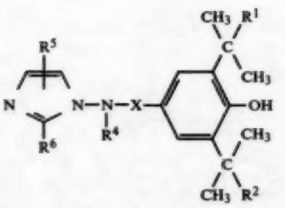


wherein R^1 and R^2 each is lower alkyl, X is a residue of the formula

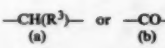


R^3 is hydrogen and R^4 is hydrogen or lower alkyl or R^3 and R^4 taken together are an additional carbon-nitrogen bond; R^5 is hydrogen or lower alkyl; R^6 is hydrogen, lower alkyl, lower alkylthio or a residue of the formula —NR^7R^8; and R^7 and R^8 each is lower alkyl or together with the nitrogen atom are a 5- or 6-membered saturated heterocycle selected from the group consisting of morpholino, piperidino and pyrrolidino, or a pharmaceutically acceptable acid addition salt thereof.

13. A pharmaceutical composition comprising an anti-inflammatorily effective amount of a compound of the formula



wherein R^1 and R^2 each is lower alkyl, X is a residue of the formula



R^3 is hydrogen and R^4 is hydrogen or lower alkyl or R^3 and R^4 taken together are an additional carbon-nitrogen bond; R^5 is hydrogen or lower alkyl; R^6 is hydrogen, lower alkyl, lower alkylthio or a residue of the formula —NR^7R^8; and R^7 and R^8 each is lower alkyl or together with the nitrogen atom are a 5- or 6-membered saturated heterocycle selected from the group consisting of morpholino, piperidino and pyrrolidino, or a

pharmaceutically acceptable acid addition salt thereof, and an inert carrier material.

4,908,364

SUBSTITUTED 3-PHENYL-7H-THIAZOL[3,2-B][1,2,4]-TRIAZIN-7-ONES

Werner Thorwart, Hochheim am Main; Ulrich Gebert, Kelkheim; Rudolf Schleyerbach, Hofheim am Taunus, and Robert R. Bartlett, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

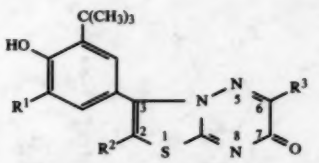
Filed Jan. 28, 1988, Ser. No. 149,603

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702758

Int. Cl.[4] A61K *31/53, 31/55;* **C07D** *513/04, 417/06*

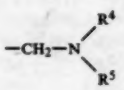
U.S. Cl. 514—243 **14 Claims**

1. A substituted 3-phenyl-7H-thiazolo[3,2,b][1,2,4]triazin-7-one of the formula I



in which

R^1 is a straight-chain or branched alkyl group having 1 to 4 carbon atoms, hydroxymethyl or an aminomethyl group of the formula II



(II)

R^2 is a hydrogen atom or an alkyl radical having 1 to 3 carbon atoms, and

R^3 is a hydrogen atom, a straight-chain or branched alkyl group having 1 to 4 carbon atoms, hydroxymethyl or an aminomethyl group of the formula II, where

R^4 and R^5 are identical or different and are a hydrogen atom or a straight-chain or branched alkyl radical having 1 to 4 carbon atoms, or the two radicals, together with the nitrogen atom to which they are bound, form a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, hexamethyleneimino, morpholino, thiomorpholino, piperazino and homopiperazino, whereby said piperazino and homopiperazino rings can be alkylated on their second nitrogen atom with (C_1–C_4) alkyl, or a physiologically acceptable acid-addition salt of the compound having the structural element of the formula II in the positions of R^1 and/or R^3.

6. A pharmaceutical composition comprising an amount effective for use in the therapy of a mammal of at least one compound of the formula I as claimed in claim 1 or a physiologically acceptable acid-addition salt of said compound having the structural element of the formula II as claimed in claim 1 in the position of at least one of R^1 and R^3, together with a pharmaceutical excipient.

4,908,365

BENZHYDRYLOXYETHYLPIPERAZINE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

André Buzas, 25 Route de Versailles, 91570 Bievres; Jean-Yves Merour, 216 Allée des Perveuches, and Roland Ollivier, 94, rue des Fauvettes, both of 45160 Olivet, all of France

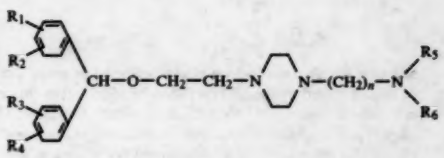
Filed Jul. 7, 1987, Ser. No. 71,483

Claims priority, application France, Jul. 10, 1986, 86 10114

Int. Cl.[4] A61K *31/495;* **C07D** *403/06*

U.S. Cl. 514—252 **16 Claims**

1. Benzhydryloxyethylpiperazine derivatives corresponding to the formula II:



in which:

R_1, R_2, R_3, R_4 independently of one another represent a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or the trifluoromethyl group;

n is an integer between 1 and 6 inclusive; and

R_5 and R_6 represent in one case a hydrogen atom and in the other a benzoyl or benzoyl substituted with a member selected from the group consisting of hydroxyl, carboxyl and nitro, or R_5 and R_6 form, with the nitrogen atom to which they are bonded, a 5-membered or 6-membered heterocyclic group selected from the following groups: succinimidyl, 4-phenylsuccinimidyl, phthalimidyl, napthalimidyl, phthalimidinyl, 3-hydroxyphthalimidinyl, 2-oxobenzimidazolinyl, 3-benzyl-2-oxobenzimidazolinyl, 1,2,3,4-tetrahydro-2,4-dioxoquinazolinyl, 3,4-dihydro-4-oxoquinazolinyl, 3,4-dihydro-4-oxo-2-methylquinazolinyl, 3,7-dihydro-1,3-dimethyl-2,6-dioxo-1H-purinyl and 3,7-dihydro-3,7-dimethyl-2,6-dioxo-1H-purinyl.

16. Pharmaceutical compositions which contain a derivative as claimed in claim 1 as the active ingredient, in combination with a pharmaceutically acceptable vehicle.

4,908,366

ANTIBACTERIAL 8-CYANO-1-CYCLOPROPYL-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS

Michael Schriewer; Klaus Grobe, both of Odenthal; Uwe Petersen, Leverkusen; Ingo Haller, Wuppertal; Karl G. Metzger, Wuppertal; Rainer Endermann, Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

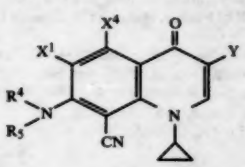
Filed Jan. 14, 1988, Ser. No. 144,884

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702393

Int. Cl.[4] A61K *31/495;* **C07D** *401/04*

U.S. Cl. 514—252 **8 Claims**

1. An 8-cyano-1-cyclopropyl-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid derivative of the formula



in which

Y represents carboxyl, nitrile, —$COOR^1$ or —$CONR^2R^3$, wherein

R^1 represents alkyl, and

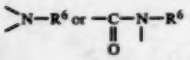
R^2 and R^3 each independently represent hydrogen or alkyl, and

R^3 represents an unsubstituted phenyl,

X^1 represents hydrogen, nitro, alkyl, or halogen,

X^4 represents hydrogen or halogen or alkyl,

R^4 and R^5, together with the nitrogen atom to which they are bonded, form 6-membered heterocyclic ring which additionally has the group



as a ring member and which is unsubstituted or mono-, di- or trisubstituted on the carbon atoms by identical or different substituents said substituents being C_1–C_4-alkyl, phenyl and cyclohexyl and said substituents being unsubstituted or mono-, di-or trisubstituted by chlorine, fluorine, bromine, methyl, phenyl, hydroxyl, methoxy, benzloxy, nitro or piperidino, 2-thienyl, hydroxy, alkoxy with one to three carbon atoms, amino, methylamino, ethylamino, aminomethyl, methylaminomethyl and ethylaminomethyl,

wherein

R^6 represents hydrogen, a branched or straight-chain alkyl, alkenyl or alkynyl which has 1 to 6 carbon atoms and is unsubstituted or substituted by one or two hydroxyl, alkoxy, alkylamino or dialkylamino groups with in each case 1 to 3 carbon atoms in the alkyl radical, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alcohol part, phenylalkyl which is unsubstituted and has up to 4 carbon atoms in the aliphatic part, phenacyl which is unsubstituted or mono- or disubstituted by hydroxyl, methoxy, chlorine or fluorine, or an oxoalkyl radical with up to 6 carbon atoms, or furthermore denotes a radical COR^7 or SO_2R^8,

wherein

R^7 represents hydrogen, straight-chain or branched alkyl which has 1 to 4 carbon atoms and is unsubstituted or substituted by 1 or 2 substituents said substituents being amino, alkyoxycarbonyl with 1 to 3 carbon atoms in the alkyl part, carbonxyl, alkoxy with 1 to 3 carbon atoms and halogen, or amino, alkylamino or dialkylamino with 1 to 5 carbon atoms in the alkyl part, and

R^8 represents straight-chain or branched alkyl with 1 to 3 carbon atoms, and pharmaceutically acceptable hydrates or salts thereof, and their esters.

8. A method of combating bacterial which comprises administering to a patient in need thereof an amount therefor of a compound according to claim **1**.

4,908,367

N-(1H-INDOLE-4-YL)-BENZAMIDES

Francois Clemence; Jacques Guillaume, both of Paris, and Gilles Hamon, Montrouge, all of France, assignors to Roussel Uclaf, Paris, France

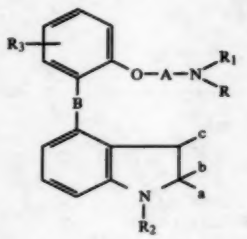
Continuation-in-part of Ser. No. 883,915, Jul. 10, 1986, Pat. No. 4,791,109. This application Dec. 21, 1987, Ser. No. 136,118

Claims priority, application France, Jul. 11, 1985, 85 10648; Dec. 19, 1986, 86 17810; Jan. 9, 1987, 87 00151

Int. Cl.[4] A61K *31/495, 31/535;* **C07D** *403/12*

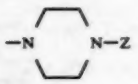
U.S. Cl. 514—253 **26 Claims**

1. A compound of the formula

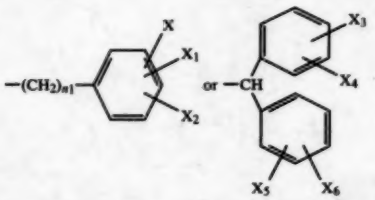


I'

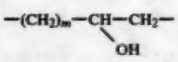
wherein R_1 and R form, with the nitrogen atom to which they are attached,



in which Z is naphthyl, benzyl, phenethyl



n_1 is 1, 2, or 3 and X, X_1, X_2, X_3, X_4, X_5 and X_6 are individually selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 3 carbon atoms, halogen, nitro, amino, monoalkylamino or dialkylamino radical, with the proviso that X, X_1 and X_2 are not all three hydrogen, A is $—(CH_2)_n—$, —n is 2, 3, 4 or 5 or



in which m is 1, 2 or 3, B is —CO—NH— or —NH—CO—, R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 3 carbon atoms, chlorine, bronine or iodine, nitro or amino unsubstituted or substituted with an aliphatic acyl of 2 to 5 carbon atoms or with alkyl of 1 to 5 carbon atoms, a together with b is an oxo group, or together with c is a second bond between the carbons which bear them, b is hydrogen or together with a is an oxo, c is hydrogen or together with a is a second bond between the carbons which bear them, and R_2 is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl or alkynyl of 2 to 5 carbon atoms or aralkyl of 7 to 12 carbon atoms unsubstituted or substituted with 1, 2 or 3 members of the group consisting of halogen, methyl, ethyl, methoxy, ethoxy, trifluoromethyl, methylthio, amino and nitro or cycloalkylalkyl of 4 to 7 carbon atoms and its non-toxic, pharmaceutically acceptable acid addition salts.

18. A method of inducing antiarrythmic activity in warm-blooded animals comprising administering to warm-blooded animals an antiarrythmically effective amount of at least one compound of claim **1**.

4,908,368

PYRIMIDINE COMPOUNDS AS ANTAGONISTS OF SRS-A

Kiyoshi Murase, No. 809-1, Amanuma-cho, 2-chome, Omiya-shi, Saitama; Toshiyasu Mase, No. 81, Maruyama-cho, Nijusseikigaoka, Matsudo-shi, Chiba; Hiromu Hara, No. 2-505, Mizonuma danchi, Mizonuma, Asaka-shi, Saitama, and Kenichi Tomioka, No. 1214-76, Sakata, Okegawa-shi, Saitama, all of Japan

Division of Ser. No. 173,734, Mar. 25, 1988, Pat. No. 4,855,310, which is a continuation-in-part of Ser. No. 796,628, Nov. 8, 1985, abandoned. This application Jun. 7, 1989, Ser. No. 362,959

Claims priority, application Japan, Nov. 12, 1984, 59-238991; Oct. 1, 1985, 60-219327

Int. Cl.[4] C07D *239/60, 239/58;* A61K *31/505*

U.S. Cl. 514—256 11 Claims

2. A pharmaceutical composition useful as an antagonist of slow reacting substance of anaphylaxis (SRS-A) and containing as an individual adult dose amount, from 0.1 to 500 mg. of a heterocyclic ring compound represented by the formula (I) or a pharmaceutically acceptable salt thereof wherein R^1 represents a lower alkanoyl group; R^2 represents a lower alkyl group; A represents a lower alkylene group which may be substituted by a hydroxyl group; Y represents oxygen, sulfur, a carbonylimino group (—CONH—), or an iminocarbonyl group (—NHCO—);

represents a pyrimidine ring; R^3, R^4 and R^5, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a group shown by the formula —A^1—R^6 (wherein A^1 represents a lower alkylene group, R^6 represents a hydroxyl group, a mercapto group, a carboxy group or a lower alkoxycarbonyl group), a hydroxyl group, a mercapto group, a lower alkoxy group, a lower alkylthio group, a group shown by the formula —Y^1—A^2—R^7 (wherein Y^1 represents oxygen or sulfur, A^2 represents a lower alkylene group, R^7 represents a carboxy group, a lower alkoxycarbonyl group, a hydroxyaminocarbonyl group, a mono- or di-lower alkylaminocarbonyl group or an N-lower alkyl-hydroxyaminocarbonyl group), an oxo group (=O), a thioxo group (=S), an amino group, a group shown by the formula —NH—R^8 wherein R^8 represents a carboxy lower alkyl group or a lower alkoxycarbonyl lower alkyl group), a group shown by the formula —NH—CO—R^9 (wherein R^9 represents a carboxy-lower alkyl group, a lower alkoxycarbonyl lower alkyl group, a lower alkoxypheny lower alkoxycarbonyl lower alkyl group, a carboxy group or a lower alkoxycarbonyl group), a carboxy group or a group shown by the formula —CO—R^{10} (wherein R^{10} represents a lower alkoxy group).

11. A method of inhibiting the production and release of SRS-A in a host which comprises administering to said host a pharmaceutically effective amount of the composition of claim 2.

4,908,369

USE OF 1,4-DISUBSTITUTED-PIPERIDINYL COMPOUNDS IN THE MANUFACTURE OF A MEDICAMENT FOR THE TREATMENT OF INSOMNIA

Paul J. Schechter; John M. Orwin, both of Strasbourg, France, and Christian K. Hinze, Rheinau-Honau, Fed. Rep. of Germany, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

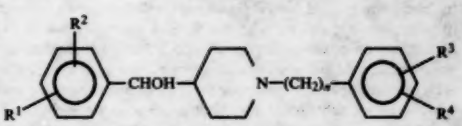
Filed Jan. 19, 1989, Ser. No. 299,913

Claims priority, application European Pat. Off., Jan. 21, 1988, 88400131.4

Int. Cl.[4] A61K *31/435*

U.S. Cl. 514—277 20 Claims

1. A method for the treatment of insomnia comprising administering to a patient suffering from insomnia, a hypnotic quantity of a compound of the formula:



wherein n is 2, 3, or 4, each of R^1, R^2, and R^4 is independently selected from hydrogen, halogen, trifluoromethyl, C_{1-6} alkyl, C_{1-16} alkoxy, hydroxy or amino; or a pharmaceutically acceptable acid addition salt thereof.

4,908,370

ANXIOLYTIC-N-(1-AZABICYCLO(2.2.2)OCT-3-YL) BENZAMIDES AND THIOBENZAMIDES

Robert J. Naylor, and Brenda Naylor, both of Ilkley, England, assignors to A. H. Robbins Company, Inc., Richmond, Va.

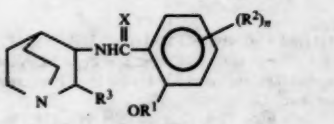
Filed Dec. 15, 1987, Ser. No. 133,410

Claims priority, application United Kingdom, Dec. 16, 1986, 8629962; Apr. 22, 1987, 8709508; Jul. 20, 1987, 8717050

Int. Cl.[4] A61U *31/44*

U.S. Cl. 514—305 16 Claims

1. A method for the treatment or prophylaxis of anxiety comprising the administration to a warm-blooded animal requiring such treatment or prophylaxis of an anxiolytically effective amount of a compound of general formula I:



wherein:

X represents oxygen or sulphur;

R^1 represents loweralkyl;

R^2 represents hydrogen, halo, 4,5-benzo, loweralkoxy, amino, methylamino or dimethylamino;

R^3 represents hydrogen or loweralkyl; and

n is 1 or 2

or a pharmaceutically acceptable acid addition salt thereof.

4,908,371

ESTERIFIED HYDROXY DIHYDROPYRIDINONES FOR TREATING DISEASES ASSOCIATED WITH TRIVALENT METAL ION OVERLOAD

Theophile Moerker, Füllinsdorf, and Heinrich Peter, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

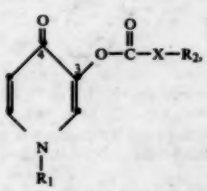
Filed Nov. 1, 1988, Ser. No. 265,646

Claims priority, application Switzerland, Nov. 10, 1987, 4376/87

Int. Cl.[4] C07D *401/12;* A61K *31/445*

U.S. Cl. 514—318 11 Claims

1. A compound of formula



(I)

wherein R_1 is an unsubstituted or substituted hydrocarbon radical, X is a bond or a group of formula —O— or —N(R_3)—,

wherein R_3 is hydrogen or an unsubstituted or substituted hydrocarbon radical, and R_2 is an unsubstituted or substituted hydrocarbon radical, or wherein R_2 and R_3, when taken together, are an unsubstituted or substituted divalent hydrocarbon radical, and wherein the other ring carbon atoms of the 4(1H)-pyridinone ring, independently of one another, are unsubstituted or substituted by an unsubstituted or substituted hydrocarbon radical or by etherified or esterified hydroxy, or a salt of such compound having salt-forming properties.

11. A method of treating disease of pathological conditions of the human or animal body, associated with trivalent metal ion overload which comprises the use of a compound as claimed in claim **1**.

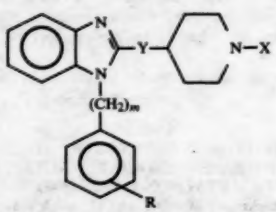
4,908,372

ANTIHISTAMINIC PIPERIDINYL BENZIMIDAZOLES

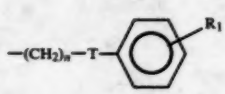
Albert A. Carr; Hsien C. Cheng, and John M. Kane, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Oct. 13, 1988, Ser. No. 256,959
Int. Cl.[4] A61K *31/445*; C07D *401/06*
U.S. Cl. 514—322 **26 Claims**

1. A compound of the formula:



wherein Y is represented by CO or CHOH: m is an integer from 1 to 2; R is represented by C_{1-4} alkyl, C_{1-4} alkoxy, halogen, hydroxy and hydrogen, X is represented by hydrogen, $COOR_2$ in which $R_2$is represented by a C_{1-4} alkyl, Or X is an alkylene phenyl radical of the formula:



wherein T is represented by CHOH, CO, O, or a direct bond; R_1 is represented by C_{1-4} alkyl, C_{1-4} alkoxy, halogen, hydroxy, 2,2-dimethyl ethanoic acid and hydrogen; n is an integer from 1 to 5; or a pharmaceutically acceptable acid addition salt thereof.

21. A method for the treatment of allergic diseases comprising administering to a patient in need thereof, an antihistaminic amount of a compound according to claim **1**.

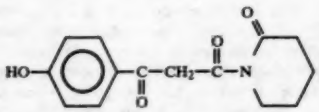
4,908,373

1-[2-(4-HYDROXYBENZOYL)ETHANOYL]-2-PIPERIDONE AND A PROCESS FOR PRODUCTION AS WELL AS ALCOHOL FERMENTATION PROMOTER CONTAINING THE SAME AS EFFECTIVE INGREDIENT

Minoru Okumura, Kakogawa; Yoshio Maekawa, Miki; Hironori Mizuno, and Osamu Yagiyu, both of Kakogawa, all of Japan, assignors to Taki Chemical Co., Ltd., Hyogo, Japan

PCT No. PCT/JP88/00392, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/08418, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 22, 1988, Ser. No. 340,096
Claims priority, application Japan, Apr. 28, 1987, 62-106038
Int. Cl.[4] C07D *211/74*
U.S. Cl. 514—327 **3 Claims**

1. 1-[2-(4-Hydroxybenzoyl)ethanoyl]-2-piperidone represented by structural formula (I):



(I)

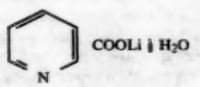
4,908,374

PHARMACEUTICAL PREPARATION FOR PROPHYLAXIS AND TREATMENT OF ALCOHOLISM

Valentin I. Kresjun, ulitsa 25-oi, Chapaevskoi divizii 5, kv. 69; Vadim L. Arysev, ulitsa Perekopskoi, divizii 17, kv. 14, both of Odessa; Georgy M. Rudenko, ulitsa Sadovo-Kudrinskaya 23, kv. 32; Andrei G. Vrublevsky, ulitsa Akademika Millionsohikova 16, kv. 206, both of Moscow; Fedor I. Kostev, ulitsa Akademika Vilyamsa 54, korpus 2, kv. 197; Roman Y. Maximovich,deceased, and Roman Y. Maximovich, administrator, both of ulitsa Perekopskoi divizii 16a, kv. 28, Odessa, all of U.S.S.R.

Filed Dec. 7, 1988, Ser. No. 281,247
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—330 **8 Claims**

1. A pharmaceutical preparation for prophylaxis and treatment of alcoholism comprising from about 10 to about 40 weight per cent of an active principle which is a nicotinic acid lithium salt semihydrate of the formula:



and a pharmaceutically acceptable vehicle.

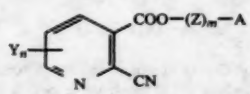
4,908,375

FUNGICIDAL COMPOSITIONS BASED ON NICOTINIC DERIVATIVES

Claude Lambert, Lyon, and Regis Pepin, Rilleux La Pape, both of France, assignors to Rhone-Poulenc Agrochimie, Lyon, France

Filed Jul. 11, 1988, Ser. No. 217,327
Claims priority, application France, Jul. 10, 1987, 87 10175
Int. Cl.[4] C07D *417/12*; A61K *31/455*
U.S. Cl. 514—342 **9 Claims**

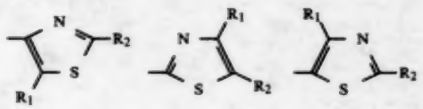
1. A nicotinic compound of formula:



(I)

in which:

A is a thiazolyl radical having one of the formulae:



(II) (III) (IV)

in which R_1 and R_2, which may be identical or different, are:

either a hydrogen atom,

or a linear or branched alkyl or alkenyl radical having 1 to 18 carbon atoms, unsubstituted or substituted with a phenyl or phenoxy in which the phenyl ring can be substituted with one to five substituents selected from the group consisting of a halogen atom and an alkyl or alkoxy radical having 1 to 4 carbon atoms,

or a phenyl radical, unsubstituted or substituted with one to five substituents selected from the group consisting of a halogen atom and an alkyl or alkoxy radical having 1 to 4 carbon atoms,

or a pyridyl or thienyl radical,

or an amino group, unsubstituted or substituted with at least one alkyl or alkoxy radical having 1 to 4 carbon atoms, phenylaminocarbonyl radical, alkylcarbonyl radical or phenylcarbonyl radical in which the phenyl is unsubstituted or substituted with one to five substituents selected from the group consisting of a halogen atom and an alkyl or alkoxy radical having 1 to 4 carbon atoms,

Z is a methylene radical,

m is an integer from 1 to 4,

Y is a halogen atom or an alkyl or alkoxy radical having 1 to 4 carbon atoms, and

n is an integer from 0 to 3.

4,908,376

2,3-DIHYDRO-2-(4,5-DIHYDROIMIDAZOL-2-YL)-INDOLES IN COMPOSITION FORM FOR REDUCING INTRAOCULAR PRESSURE

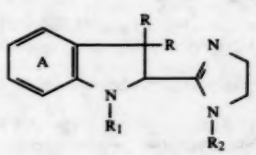
Charles F. Huebner, Chatham, N.J., and John E. Francis, Briarcliff Manor, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 771,935, Sep. 3, 1985. This application Feb. 17, 1987, Ser. No. 15,820

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—402 **1 Claim**

1. A pharmaceutical composition comprising a pharmaceutically acceptable excipient and an effective intraocular pressure reducing amount of a compound of the formula



(I)

wherein each R is hydrogen or one is hydrogen and one is lower alkyl; R_2 is hydrogen or lower alkyl; and ring A is unsubstituted or substituted by lower alkoxy, and R_1 is hydrogen, methyl, or benzyl; or a pharmaceutically acceptable acid addition salt thereof.

4,908,377

PESTICIDAL SUBSTITUTED 5-ETHYLAMINO-1-ARYLPYRAZOLES

Uta Jensen-Korte, Duesseldorf; Otto Schallner, Monheim; Jörg Stetter; Peter Andrews, both of Wuppertal; Benedikt Becker, Mettmann; Bernhard Homeyer, Leverkusen; Wilhelm Stendel, Wuppertal, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

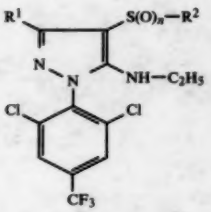
Filed Jun. 2, 1988, Ser. No. 201,247

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719733

Int. Cl.[4] C07D *231/44*; A01N *43/56*

U.S. Cl. 514—404 **9 Claims**

1. A substituted 5-ethylamino-1-arylpyrazole of the formula



in which

R^1 represents hydrogen or alkyl,

R^2 represents halogenoalkyl and

n represents a number 0, 1 or 2, with the proviso that if R^1 is hydrogen, R^2 cannot be dichlorofluoromethyl and n is not 0.

4,908,378

BENZOPYRAN DERIVATIVES AND ANTIHYPERTENSIVE USE THEREOF

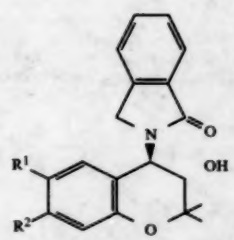
Richard M. Soll, Lawrenceville, N.J., and Paul J. Dollings, Newtown, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 12, 1989, Ser. No. 336,966

Int. Cl.[4] C07D *405/04*; A61K *31/40*

U.S. Cl. 514—414 **8 Claims**

1. A compound of formula (I)



(I)

wherein R^1 is trifluoromethylsulfonyl or trifluoromethylsulfinyl and R^2 is H; or R^1 is H or nitro and R^2 is CF_3CONH.

8. A method of treatment of hypertension in mammals which comprises administering to the mammal in need thereof an effective antihypertensive amount of a compound of formula (I).

4,908,379

NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS AND COMPOSITIONS FOR CONTROLLING AND/OR PREVENTING PESTS AND BLIGHTS (DISEASES)

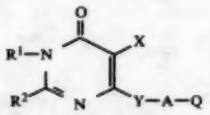
Yasuyuki Nakajima; Takahiro Makabe; Kazunari Nakayama; Tatsuo Numata, all of Funabashi; Kiminori Hirata, Saitama; Masaki Kudo, Saitama; Yoshinori Ochiai, Saitama, and Masayoshi Hirose, Tokyo, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,992

Int. Cl.[4] C07D *239/56, 239/52, 239/60;* **A01N** *43/54*

U.S. Cl. 514—274 **7 Claims**

1. A 4(3H)-pyrimidinone compound having the following formula:



wherein

R^1 represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 5 carbon atoms or a cycloalkyl group having 3 to 8 carbon atoms;

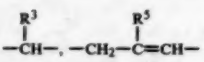
R^2 represents hydrogen atom, an alkyl group having 1 to 5 carbon atom, an alkoxy group having 1 to 5 carbon atoms, an alkylthio group having 1 to 5 carbon atoms or a phenyl group, and,

R^1 and R^2 together form a member of

X represents halogen atom, an alkyl group having 1 to 5 carbon atoms, a phenyl group, a benzyl group, or an alkoy group having 1 to 5 carbon atoms;

Y represents an oxygen atom or sulfur atom;

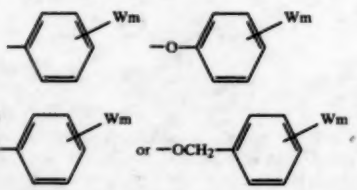
A represents



or —CH_2—CH_2—O—,

R^3 and R^5 represent hydrogen atom or an alkyl group having 1 to 5 carbon atoms;

Q represents a phenyl group having substituents or pyridine which may have substituents wherein substituents for Q are selected from the group consisting of halogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an alkyloxy group having 1 to 10 carbon atoms, a haloalkyl group having 1 to 5 carbon atoms, an alkoxyalkyl group having 2 to 5 carbon atoms, a cyanoalkyl group having 2 to 5 carbon atoms,



wherein W represents halogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms or a haloalkyl group having 1 to 5 carbon atoms, and m represents zero or an integer of from 1 to 4, said W being the same or different when m is an integer of 2 to 4, the number of said substituents being from 1 to 4 and said substituents being the same or different when the number thereof is 2, 3 or 4.

7. A composition suitable for agricultural and horticultural uses comprising at least one 4(3H)-pyrimidone compound of claim 1 and an agriculturally acceptable carrier, said 4(3H)-pyrimidone compound being present in an amount effective to control insects, acarids, nematodes or fungi.

4,908,380

PHARMACEUTICAL COMPOSITIONS

Andrew G. Brewster, Macclesfield; George R. Brown, Wilmslow, and Michael J. Smithers, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries plc, London, England

Filed Nov. 3, 1987, Ser. No. 118,226

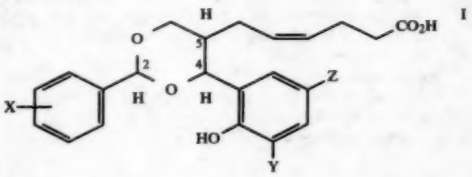
Claims priority, application United Kingdom, Nov. 4, 1986, 8626297

Int. Cl.[4] A61K *31/075*

U.S. Cl. 514—452 **14 Claims**

1. A pharmaceutical composition for use in a disease or medical condition in which thromboxane A_2 and/or a related prostanoid constrictor substance is involved which comprises as active ingredients:

(i) an effective amount of 1,3-dioxane ether of the formula I:



wherein X is selected from fluoro, chloro, bromo, trifluoromethyl, cyano, methoxy and nitro; and one of Y and Z is hydrogen or fluoro, and the other is hydrogen; and wherein the groups at positions 2, 4 and 5 of the dioxane ring have cis-relative stereochemistry; or a pharmaceutically acceptable salt thereof; and

(ii) an effective amount of inhibitor of the synthesis of thromboxane A_2 selected from the group consisting of:

(1) 4-[2-(1H-imidazol-1-yl)ethoxy]benzoic acid (dazoxiben),

(2) sodium 5-(3-pyridylmethyl)benzofuran-2-carboxylic acid (furegrelate),

(3) 3-[3-(1H-imidazol-1-ylmethyl)-2-methyl-1H-indol-1-yl]propanoic acid (UK38485),

(4) 8-[3-methyl-2-(3-pyridyl)-1H-indol-1-yl]octanoic acid (CGS12970),

(5) 5-(5-carboxypentyl)imidazo[1,5-a]pyridine (CGS13080),

(6) 6-[5-chloro-3-methyl-2-(3-pyridyl)-1H-indol-1-yl]hexanoic acid (CGS14854),

(7) (E)-4-(1-imidazolylmethyl)cinnamic acid (OKY046),

(8) sodium (E)-3-[4-(3-pyridylmethyl)phenyl]methacrylate (OKY1580),

(9) (E)-3-[4-(3-pyridylmethyl)phenyl]methacrylic acid hydrochloride (OKY1581),

(10) (E)-7-phenyl-7-(3-pyridyl)-6-heptenoic acid (CV4151),

(11) N-[(1H)-imidazol-1-yl)octyl]-4-chlorobenzamide,

(12) 1-(3-benzloxy-1(E)-octenyl)imidazole (CBS645),

(13) 2,2-dimethyl-6-[2-(1H-imidazol-1-yl)-1-([4-methoxyphenyl]methoxymethyl)-ethoxy]hexanoic acid (SC41156),

(14) sodium 4-[alpha-hydroxy-5-(1H-imidazol-1-yl)-2-methylbenzyl]-3,5-dimethyl-benzoate (Y20811); having the formulae set out hereinbefore; and the pharmaceuti-

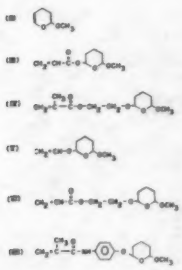
cally acceptable salts thereof or, in the case of inhibitor (2), (8), (9) and (14), the salt free form thereof;
together with a pharmaceutically acceptable diluent or carrier.

4,908,381

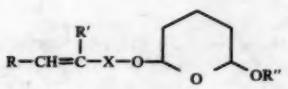
ANTIMICROBIAL FILM-FORMING COMPOSITIONS

Richard B. Greenwald, Eagan, and Isaac S. Y. Sze, St. Paul, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Dec. 5, 1988, Ser. No. 279,536
Int. Cl.[4] A01N *43/16*; C07D *315/00*
U.S. Cl. 514—460 **10 Claims**

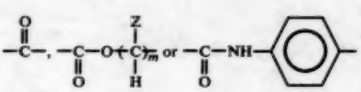


1. An antimicrobial compound having the following general formula:



(I)

wherein
R=H,(C_1–C_3)alkyl,—COOH, —CH_2—COOH,—C_6H_{11}, or -phenyl;
R′=H,(C_1–C_3)alkyl,—CH_2—COOH, —C_6H_{11}or -phenyl;
R″=H or (C_1—C_5)alkyl; and X =



where
m=2–4; and
Z=H or (C_1–C_3)alkyl.

4,908,382

METHOD FOR TREATING ASTHMA

Sebastiano Bianco, Milan, Italy, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1989, Ser. No. 308,070
Int. Cl.[4] A61K *9/14, 9/72, 31/34*
U.S. Cl. 514—471 **3 Claims**

1. A method of treatment of asthma characterized in that furosemide is inhaled.

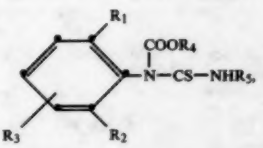
4,908,383

N-PHENYL-N-CARBOXYTHIOUREAS AND THEIR USE IN THE CONTROL OF PESTS

Jozef Drabek, Oberwil, and Josef Ehrenfreund, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 130,246, Dec. 8, 1987, abandoned. This application May 23, 1989, Ser. No. 356,665
Claims priority, application Switzerland, Dec. 17, 1986, 5056/86; Jul. 29, 1987, 2909/87
Int. Cl.[4] A01N *31/04*; C07C *149/43, 125/06*
U.S. Cl. 514—485 **9 Claims**

1. A compound of the formula I



(I)

in which
R_1 and R_2 are each C_1-C_{10}alkyl, C_3-C_7cycloalkyl or C_5-C_6cycloalkenyl,
R_3 is hydrogen, halogen, C_1-C_{10}alkyl, C_1-C_{10}alkoxy or C_1-C_{10}alkylthio,
R_4 is C_1-C_{10}alkyl, C_2-C_{10}alkenyl, C_2-C_{10}alkynyl or phenyl-C_1-C_7alkyl; C_1-C_{10}[illegible]kyl, C_2-C_{10}alkenyl, C_2-C_{10}alkynyl or phenyl-C_1-C_7alkyl each substituted one to eleven times by fluorine, chlorine or bromine or interrupted by one oxygen or sulphur atom; C_3-C_8cycloalkyl; or C_3-C_8cycloalkyl substituted one to three times by fluorine, chlorine, bromine or by C_1-C_5alkyl, and
R_5 is C_1-C_{10}alkyl; phenyl-C_1-C_7alkyl; C_1-C_{10}alkyl or phenyl-C_1-C_7alkyl each substituted one to eleven times by fluorine, chlorine or bromine or interrupted by one oxygen or sulphur atom; C_3-C_8cycloalkyl; or C_3-C_8cycloalkyl substituted one to three times by fluorine, chlorine, bromine or by C_1-C_5alkyl.

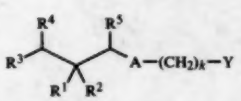
4,908,384

FATTY ACID LEUKOTRIENE SYNTHESIS INHIBITORS

Chih Y. Ho, Lansdale, and Richard J. Mohrbacher, Maple Glen, both of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Filed Aug. 29, 1986, Ser. No. 902,366
Int. Cl.[4] A61K *71/19, 13/165, 31/215*; C07C *59/40*
U.S. Cl. 514—559 **20 Claims**

1. A method for the treatment of allergic reactions or inflammatory disorders in a mammal which comprises administering to the mammal a pharmaceutical composition which comprises a combination of a pharmaceutically-acceptable diluent or carrier and a fatty acid compound of the following formula (I):



(I)

wherein
A is —CH_2—, alkylidene, 1-alkylalkylidene, —CR^6=C-R^7—, or —C≡C—;
Y is —COOH, alkoxycarbonyl, —$CONH_2$, —CONHOH, N-alkylcarboxamido or N,N-dialkylcarboxamido;
R^1 is hydroxy, mercapto, acetoxy, acetylthio, alkoxy, alkylthio or halo;
R^2 is hydrogen or R^1 and R^2 taken together are carbonyl, —$O(CH_2)_2O$— or —$O(CH_2)_3O$—;
R^3 is alkyl, alkoxy, —O—$(CH_2)_m$—alkaryl, —O—(CH_2-

$)_m$—alkoxyaryl, $-(CH_2)_n$—aryl, $-(CH_2)_n$—alkaryl or $-(CH_2)_n$—alkoxyaryl;
R^4 is hydrogen or alkyl;
R^5 is hydrogen or alkyl;
R^6 is hydrogen or alkyl;
R^7 is hydrogen or alkyl;
k is the integer 2–7;
m is the integer 0–4;
n is the integer 1–6; and
when Y is —COOH, the pharmaceutically-acceptable base addition salts thereof.

4,908,385

α-HALOGENATED DICARBOXYLIC ACIDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Jacob Bar-Tana; Yoelit Migron; Jochanan Blum, all of Jerusalem, Israel; Bruno Dreckmann, Mannheim, and Johannes Pill, Leimen, both of Fed. Rep. of Germany, assignors to Epis S.A., Zug, Switzerland

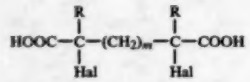
Filed Oct. 6, 1987, Ser. No. 106,557

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634356

Int. Cl.[4] A61K *31/19, 31/225, 31/16;* **C07C** *55/32*

U.S. Cl. 514—574 **11 Claims**

1. A pharmaceutical composition comprising (1) an effective amount of at least one alpha-halogenated dicarboxylic acid compound of the formula:



(I)

wherein
Hal is chlorine, bromine or fluorine
R is hydrogen or Hal, and
m is a number from 4 to 16,
or at least one pharmaceutically acceptable salt, ester or amide of said compound, and (2) a pharmaceutical carrier.

10. An alpha-halogenated dicarboxylic acid compound designated 2,2,13,13-tetrachlortetradecane-1,14-dioic acid.

4,908,386

ETHANOLAMINE DERIVATIVES

Harry Finch, Hitchin; Lawrence H. C. Lunts, Broxbourne; Alan Naylor, Royston; Ian F. Skidmore, Welwyn; Ian B. Campbell, Ware; David Middlemiss, and Charles Willbe, both of Bishops Stortford, all of England, assignors to Glaxo Group Limited, London, England

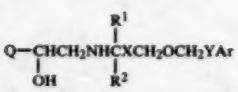
Continuation of Ser. No. 919,123, Oct. 15, 1986. This application Dec. 20, 1988, Ser. No. 287,441

Claims priority, application United Kingdom, Oct. 15, 1985, 8525478; Oct. 15, 1985, 8525479; Oct. 15, 1985, 8525480; Oct. 15, 1985, 8525481; Oct. 15, 1985, 8525485

Int. Cl.[4] C07C *143/74;* **A61K** *31/18*

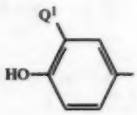
U.S. Cl. 514—605 **9 Claims**

1. A compound of formula (I).

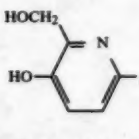


(I)

wherein
Ar represents a phenyl group optionally substituted by one or more substituents selected from halogen atoms, or the groups C_{1-6}alkyl, nitro, $-(CH_2)_qR$, [where R is hydroxy, C_{1-6} alkoxy, $-NR^3R^4$ (where R^3 and R^4 each represents a hydrogen atom, or a C_{1-4} alkyl group, or $-NR^3R^4$ forms a saturated heterocyclic amino group which has 5–7 ring members and optionally contains in the ring one or more atoms selected from —O— or —S— or a group —NH— or —N(CH_3)—), $-NR^5COR^6$ (where R^5 represents a hydrogen atom or a C_{1-4} alkyl group, and R^6 represents a hydrogen atom or a C_{1-4} alkyl, C_{1-4} alkoxy, phenyl or $-NR^3R^4$ group), $-NR^5SO_2R^7$ (where R^7 represents a C_{1-4} alkyl, phenyl or $-NR^3R^4$ group), $-COR^8$ (where R^8 represents hydroxy, C_{1-4} alkoxy or $-NR^3R^4$), $-SR^9$ (where R^9 is a hydrogen atom, or a C_{1-4} alkyl or phenyl group), $-SOR^9$, $-SO_2R^9$, or —CN, and q represents an integer from 0 to 3], or $-O(CH_2)_tR^{10}$ [where R^{10} represents a hydroxy or C_{1-4} alkoxy group, and t is an integer 2 or 3], or Ar is a phenyl group substituted by an alkylenedioxy group of formula $-O(CH_2-)_pO-$, where p represents an integer 1 or 2;
R^1 and R^2 each represents a hydrogen atom or a C_{1-3} alkyl group with the proviso that the sum total of carbon atoms in R^1 and R^2 is not more than 4;
X represents a bond or a C_{1-7} alkylene, C_{2-7} alkenylene or C_{2-7} alkynylene chain and
Y represents a bond or a C_{1-6} alkylene, C_{2-6} alkenylene or C_{2-6} alkynylene chain with the proviso that the sum total of carbon atoms in X and Y is 2–10;
Q represents the group



[where Q^1 represents the group $-CH_2R^{23}$ (where R^{23} represents C_{1-3} alkoxy, methanesulphonyl or cyano), or the group $-CH_2NHR^{11}$ (where R^{11} represents $R^{12}CO$—, $R^{12}NHCO$—, $R^{12}R^{13}NSO_2$— or $R^{14}SO_2$—, where R^{12} and R^{13} each represent a hydrogen atom or a C_{1-3} alkyl group, and R^{14} represents a C_{1-3} alkyl group), or the group $-NR^{15}R^{16}$ (where R^{15} represents a hydrogen atom or a C_{1-4}alkyl group, and R^{16} represents a hydrogen atom or a C_{1-4}alkyl group or, when R^{15} is a hydrogen atom, R^{16} also represents a C_{1-4} alkoxycarbonyl group)], or Q represents the group



or Q represents a phenyl group substituted by a hydroxy group and optionally also by a halogen atom;
or a physiologically acceptable salt or solvate thereof.

4,908,387

USE OF BETA$_2$ ANTAGONISTS IN THE TREATMENT OF INFLAMMATORY DISEASES IN IN PARTICULAR RHEUMATOID ARTHRITIS

Jon D. Levine, and Allan I. Basebaum, both of San Francisco, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 6, 1988, Ser. No. 203,355

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—653 **23 Claims**

1. A method of treating inflammatory disorders in mammals which comprises administering a therapeutically effective amount of a selective beta$_2$ antagonist to a mammal in need of such treatment, wherein the antagonist is an alkylaminoalkanol selected from the group consisting of butoxamine, ICI 118,551 and H35/25.

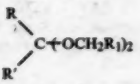
4,908,388

BEHAVIOR MODIFYING COMPOUNDS

John A. Pickett, and Ewen D. M. Macaulay, both of Hitchin, England, assignors to National Research Development Corporation, London, United Kingdom

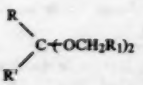
Division of Ser. No. 3,150, Jan. 14, 1987, Pat. No. 4,780,479, which is a division of Ser. No. 609,864, May 14, 1984, Pat. No. 4,657,926. This application Jan. 20, 1988, Ser. No. 146,050
Claims priority, application United Kingdom, May 21, 1983, 8314521
Int. Cl.[4] A01N *33/18, 33/24;* C07C *48/30*
U.S. Cl. 514—716 28 Claims

1. In a method for influencing insect behaviour by the application to a selected locus of an insect behaviour modifying compound containing a carbonyl group, the improvement which comprises using the said compound in the form of a photolabile derivative of formula



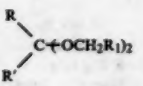
wherein RR'C< represents the residue of the carbonyl group-containing insect behaviour modifying compound being a divalent aliphatic hydrocarbon group of 7 to 18 carbon atoms, and R_1 represents an unsubstituted phenyl group, a phenyl group substituted by one or two substituents selected from the group consisting of nitro, halogen, alkoxy, alkyl, and amide and C_{1-5} alkyl, ester, cyano, carboxy, groups of carboxy, or a phenyl group to which is fused a benzene ring which can be substituted by one or two of said substituents.

13. A composition for influencing insect behaviour which comprises a photolabile insect behaviour modifying compound of formula



wherein RR'C< represents the residue of a carbonyl group-containing insect behaviour modifying compound, being a bivalent aliphatic hydrocarbon group of 7 to 18 carbon atoms, and R_1 represents an unsubstituted phenyl group, a phenyl group substituted by one or two substituents selected from the group consisting of nitro, halogen, alkoxy, alkyl, cyano, carboxy, and amide and C_{1-5} alkly ester groups of carboxy, or a phenyl group to which is fused a benzene ring which can be substituted by one or two of said substituents, and an agriculturally suitable solid or liquid carrier with which the compound is integral or non-integral.

22. A photolabile derivative of a carbonyl group-containing insect behaviour modifying compound having the formula



wherein RR'C< represents a bivalent aliphatic hydrocarbon group of 7 to 18 carbon atoms and R_1 represents an unsubstituted phenyl group, a phenyl group substituted by one or two substituents selected from the group consisting of nitro, halogen, alkoxy, alkyl, cyano, carboxy, and amide and C_{1-5} alkyl ester groups of carboxy, or a phenyl group to which is fused a benzene ring which can be substituted by one or two of said substituents.

4,908,389

PENETRATION ENHANCEMENT SYSTEM

Majid Mahjour, Morris Plains; Uma Iyer, Mendham, and Mahdi B. Fawzi, Flanders, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 27, 1986, Ser. No. 900,865
Int. Cl.[4] A61K *31/08, 47/00*
U.S. Cl. 514—772 2 Claims

1. A transmembranally administrable composition comprising:

(a) about 0.2% to about 5% of a bioaffecting agent selected from the group consisting of procaterol, 4,5-dihydro-6-[4-(1H-imidazole-1-yl)phenyl]-5-methyl-3-(2H)-pyridazinone, morphine, hydromorphone, propanolol, chlorpheniramine and a pharmaceutically acceptable organic or inorganic acid,

(b) about 1% to about 202% of a fatty component selected from the group consisting of linoleic acid, C_1–C_3 linoleic esters, and a monohydroxy linoleyl alcohol,

(c) about 80% to about 99% of a secondary component consisting of a mixture of a compound selected from the group consisting of isopropanol, propylene glycol, polyethylene glycol 400 and tetraglycol, and a compound selected from the group consisting of triacetin and triethyl citrate.

4,908,390

METHOD OF PREPARING METHANOL

Jury S. Matros, and Ilya A. Zolotarsky, both of Novosibirsk, U.S.S.R., assignors to Akademii Institut Katalizza Sibirskogo Otdelenia Nauk SSSR, Novosibirsk, U.S.S.R.

PCT No. PCT/SU87/00112, § 371 Date Jun. 7, 1988, § 102(e) Date Jun. 7, 1988, PCT Pub. No. WO88/02744, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 14, 1987, Ser. No. 240,235
Claims priority, application U.S.S.R., Oct. 17, 1986, 4131462
Int. Cl.[4] C07C *27/06*
U.S. Cl. 518—706 2 Claims

1. A method of preparing methanol from a synthesis-gas containing carbon oxides and hydrogen by passing the synthesis-gas through a stationary bed of a copper-containing catalyst at a temperature of 150°–300° C. and a pressure of 3.0–15.0 MPa with the formation of a reaction mixture containing the desired product, the direction of each subsequent passage of the synthesis-gas through the catalyst bed and the direction of the removal of the reaction mass being reversed with respect to the preceding one, characterized in that the catalyst bed is divided into two parts either in an equal volume ratio or in the minor/major volume ratio equal to 0.5–1, the gas mixture resulting after passing the first part of the catalyst bed being stirred before supplying it to the second part of the catalyst bed.

4,908,391

OPACIFIERS FOR PAINTS AND COATINGS

George E. Melber, Depew, and Leon Wolinski, Checktowaga, both of N.Y., assignors to Pierce & Stevens, Buffalo, N.Y.

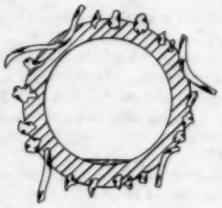
Continuation-in-part of Ser. No. 28,119, Mar. 19, 1987, Pat. No. 4,722,943, Ser. No. 103,203, Oct. 1, 1987, and Ser. No. 103,204, Oct. 1, 1987, said Ser. No. 103,203, and Ser. No. 103,204, each is a division of Ser. No. 28,119,. This application Jul. 29, 1988, Ser. No. 225,755
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.
Int. Cl.[4] C08J *9/22, 9/32*
U.S. Cl. 521—57 6 Claims

1. The method of making a composite opacifier for coatings, comprising:

A. mixing an particulate inorganic coating opacifier component with expandable thermoplastic resin microspheres, said opacifier component comprising from 20 to 97 weight percent of the mixture, with a material proportion of said

opacifier component having a particle size of from about 200 to about 2000 millimicrons;

B. heating the mixture of said opacifier component and said microspheres under conditions of time, temperature and pressure to cause said opacifier component to be embedded in and adhered to the surface of said microspheres;



C. thermally expanding said composite to attain a composite specific gravity of from about 0.1 to about 2.8 gm/cc;

D. recovering said opacifier for incorporation into coating formulations.

4,908,392

PROCESS FOR PRODUCING CROSSLINKED POLYMER PARTICLES

Hiroshi Kusano; Hideaki Kiniwa, both of Yokohama; Akihiro Shimura, Machida, and Masahiko Annaka, Mitaka, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 181,575, Apr. 14, 1988. This application Mar. 27, 1989, Ser. No. 329,289

Claims priority, application Japan, Apr. 22, 1987, 62-99524

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—60 23 Claims

1. A process for producing porous crosslinked polymer particles which comprises a first step of polymerizing a polymerizable monomer containing from 0.1 to 2.0% by weight, based on the entire polymerizable monomer, of a crosslinkable monomer in a medium in which the polymerizable monomer is soluble but the resulting polymer is insoluble, to obtain crosslinked polymer particles having a particle size of from 0.8 to 10 μm, and a second step of letting the crosslinked polymer particles absorb a pore-forming solvent to impregnate the crosslinked particles and from 1 to 50 times by weight of a polymerizable monomer containing from 2 to 100% by weight, based on the entire polymerizable monomer, of a crosslinkable monomer in an aqueous medium, followed by polymerization to obtain crosslinked polymer particles having a particle size of from 1 to 30 μm and a crosslinking degree of from 1.0 to 98%.

4,908,393

PROPYLENE RESIN FOAMED PARTICLES AND FOAMED MOLD ARTICLE

Masakazu Arai; Hiroshi Endo; Toshihiro Gotoh; Toshio Yagi; Masanori Tanaka; Masanori Saito, and Shigeki Mathuno, all of Mie, Japan, assignors to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

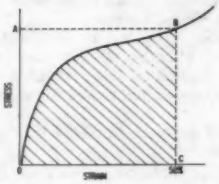
Filed Mar. 9, 1989, Ser. No. 321,217

Claims priority, application Japan, Mar. 24, 1988, 63-70186; Dec. 9, 1988, 63-311685

Int. Cl.[4] C08J *9/18*

U.S. Cl. 521—60 1 Claim

1. A bumper core material for use in automobile bumpers which is composed of a foamed mold article of a random copolymer of propylene and 1-butene, said random copolymer having a 1-butene content of from 3 to 12% by weight, said foamed mold article having a density of from 0.02 to 0.08 g/cm^3, a compression stress at 50% compression as measured at 20° C. of 2.5 to 10 kg/cm^2, and an energy absorption efficiency as measured at 20° C. of 60 to 90%, the ratio (E_{80}/E_{20}) of the amount of the energy absorption of said foamed mold article as measured at 80° C. (E_{80}) to the amount of the energy



absorption of said foamed mold article as measured at 20° C. (E_{20}) being 0.5 to 0.9.

4,908,394

DIAMINOBENZOATE CATALYTIC CHAIN EXTENDERS

Jeremiah P. Casey, Emmaus, and Susan M. Clift, North Wales, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 75,364, Jul. 20, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,217

Int. Cl.[4] C08G *18/18*

U.S. Cl. 521—163 4 Claims

1. In a process for the preparation of a polyurethane composition by reacting a polyisocyanate with a polyol, a chain extender and a catalyst, the improvement which comprises reacting a catalytic chain extender comprising a diaminobenzoate having a tertiary amine functionality incorporated into a side chain of the diaminobenzoate.

4,908,395

PHOTOCURABLE ADHESIVE COMPOSITION FOR GLASS

Atsushi Kurita; Masayuki Hatanaka, both of Gunma, and Sam Huy, Tokyo, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,661

Claims priority, application Japan, Apr. 23, 1987, 62-100750

Int. Cl.[4] C08F *283/12;* C08G *77/04*

U.S. Cl. 522—42 8 Claims

1. A photocurable adhesive composition for glass, consisting essentially of (A) 100 parts by weight of a polyorganosiloxane having an average compositional formula:

$$(CH_2{=}CH)_a(R^1)_bSiO_{\frac{4-a-b}{2}}$$

wherein R^1 represents a substituted or unsubstituted monovalent hydrocarbon group except for a vinyl group; $0<a\leqq 1$; $0<b\leqq 2$; and $1<a+b<3$, (B) from 0.1 to 10 parts by weight of an aromatic ketone photo reaction initiator, and (C) from 0.1 to 5 parts by weight of a trialkenyl isocyanurate or a derivative thereof.

4,908,396

FILLERS

Martin B. Evans, Oulton, and Roger N. Rothon, Guilden Sutton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 20, 1988, Ser. No. 196,489

Claims priority, application United Kingdom, May 22, 1987, 8712107; Jun. 25, 1987, 8714916

Int. Cl.[4] C08K *9/04;* C08L *21/00, 23/16*

U.S. Cl. 523—202 9 Claims

1. A cohesive polymer matrix comprising:

a matrix polymer and a coated particulate filler dispersed therein, characterized in that the matrix polymer is a

solution rubber, and the filler is coated, at least in part, with a composition comprising:

an organic coating polymer of number average molecular weight in the range 750 to 1,400 which contains an acidic group (or its salt, imide, or anhydride) and unsaturated groups either bonded or non-bonded to the matrix polymer at least 30% w/w of which are vinyl groups.

4,908,397

MULTI-COMPONENT COATING COMPOSITION COMPRISING AN ANHYDRIDE CONTAINING POLYMER, A GLYCIDYL COMPONENT AND A SELF-STABILIZED DISPERSION RESIN

Robert J. Barsotti, Franklinville, and Patrick H. Corcoran, Cherry Hill, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1988, Ser. No. 212,053

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[4] C08K *5/01, 5/10;* **C08L** *63/02*

U.S. Cl. 523—400 **16 Claims**

1. A coating composition comprising 20–80% by weight of reactive binder components and 80–20% by weight of an organic liquid carrier; wherein the binder consists essentially of about

(a) 25–94% by weight, based on the weight of the binder, of an anhydride acrylic polymer having at least two reactive anhydride groups that consists of polymerized monomers of an ethylenically unsaturated anhydride or an ethylenically unsaturated dicarboxylic acid and polymerized monomers selected from the group consisting of alkyl methacrylate, alkyl acrylate and any mixtures thereof, wherein the alkyl groups have 1–8 carbon atoms and the polymer has a weight average molecular weight of about 2,000–50,000;

(b) 5–50% by weight, based on the weight of the binder, of a glycidyl component having at least two reactive glycidyl groups;

(c) 1 to 40% by weight, based on the weight of the binder, of a self stabilized dispersed resin formed by polymerizing in solution the following constituents;

(1) an acrylic solution polymer,

(2) monomers of alkyl methacrylate or acrylate and hydroxy ethyl acrylate or methacrylate, wherein either the acrylic solution polymer contains post reacted glycidyl methacrylate or acrylate or the monomers additionally contain glycidyl methacrylate or acrylate, and

the composition contains about 0.1–5% by weight, based on the weight of the binder, of a catalyst.

4,908,398

POLY 1,4-DIHYDRO-2,6-DIMETHYLPYRIDINE-3,5-DICARBOXYLESTERS USEFUL AS THERMAL STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Li Bassi, Gavirate, and Roberto Ortica, Legnano, both of Italy, assignors to Lagor S.p.A., Italy

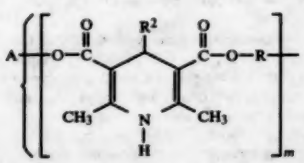
Filed Mar. 29, 1988, Ser. No. 174,864

Claims priority, application Italy, Apr. 15, 1987, 20128 A/87

Int. Cl.[4] C07D *213/55;* **C08K** *5/34*

U.S. Cl. 524—99 **7 Claims**

1. Compounds of formula (I)



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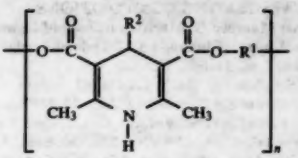
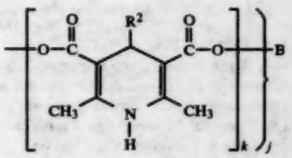




in which:

A represents a linear or branched alkyl of 1–22 C atoms, optionally substituted with one or more groups chosen from alkoxy, alkylthio, hydroxyl optionally esterified with acrylic or alkoxy, alkylthio, hydroxyl optionally esterified with acrylic or methacrylic acid, halogen, aryl; phenyl or aryl of carbocyclic or heterocyclic type optionally substituted with one or more alkyl, alkoxy or halogen groups; alkenyl of 3–10 C atoms; $CH_3COCH_2COO—R—$; $CH_3COCH_2COO—R^1$; $CH_3—C(NH_2)=CH—COOR—$; $CH_3—C(NH_2=CHCOO—R^1—$; in which the amino group can carry one or more substituents of alkyl, hydroxyalkyl or alkoxyalkyl type or a cyclic substituent of polyalkylene or oxapolyalkylene type, or methylene or a linear or branched alkenyl of 2–22 C atoms;

B can assume the same meaning as A, or can represent a trivalent or polyvalent residue consisting of a linear or branched carbon atom chain optionally carrying substituents of alkoxy, thioalkoxy, aryl, carboxyl or hydroxyl type;

m, n are whole numbers from 0 to 20, the sum of which is at least 2;

k is 0 or 1;

j is a whole number from 1 to 6;

j (k+m+n) is a whole number equal or greater than 2;

R and R^1 each independently represent a bivalent hydrocarbon residue, a methylene or phenylene group, or a bivalent residue comprising at least one alkylene group of the type;

$$—(—C_pH_{2p}—X—)_t—C_pH_{2p}$$

in which p is a whole number from 2 to 18, t is a whole number from 0 to 10 and X is oxygen or sulphur, said alkylene group optionally carrying substitutions of alkoxy or thioalkoxy, aryl, carboxyl or hydroxyl type; or R and R^1 represent a direct bond with B only if k is 0 and j is greater than 1: R_2 represents hydrogen or a monovalent residue of linear or branched alkyl, alkoxycarbonyl.

4. Vinylchloride polymer or copolymer-based compositions containing usual additives, processing auxiliaries and primary stabilizers, comprising as thermal stabilizer at least one compound of formula (I) as defined in claim 1 to the extent of between 0.01% and 3% of the polymer by weight.

4,908,399
ENCAPSULATING COMPOSITIONS

Stephen J. Harris; Maureen G. MacManus, both of Dublin, and John Guthrie, County Kildare, all of Ireland, assignors to Loctite (Ireland) Ltd., Dublin, Ireland

Continuation of Ser. No. 100,494, Sep. 24, 1987, abandoned, and a continuation-in-part of Ser. No. 88,945, Aug. 24, 1987, which is a continuation-in-part of Ser. No. 914,491, Oct. 2, 1986, Pat. No. 4,718,966, which is a division of Ser. No. 776,536, Sep. 16, 1985, Pat. No. 4,636,539, which is a division of Ser. No. 673,621, Nov. 21, 1984, Pat. No. 4,556,700, said Ser. No. 100,494, is a continuation-in-part of Ser. No. 870,677, Jun. 4, 1986, Pat. No. 4,699,966, which is a continuation-in-part of Ser. No. 717,251, Mar. 28, 1985, Pat. No. 4,642,362. This application Nov. 14, 1988, Ser. No. 270,136

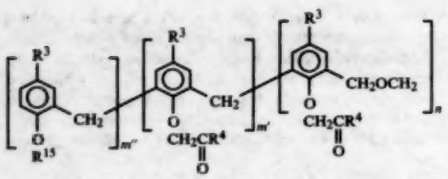
Claims priority, application Ireland, Sep. 29, 1986, 2567/86

Int. Cl.[4] C08L *23/00*

U.S. Cl. 524—243 **11 Claims**

1. An improved curable composition suitable for the encapsulation of electronic devices, said composition comprising a curable epoxy resin and, as the improvement therefor, from 0.5 to 10 percent by weight of a metal ion scavenger effective in reducing the level of metal ion or chloride ion or both metal ion and chloride ion extractables from said composition, said metal ion scavenger selected from the group consisting of

(A) Calixarene or oxacalixarene derivatives represented by the formula



II

wherein

$m'+m''=0$–8;

$n=0$–8;

$m' \geqq \frac{1}{4}(m'+m'')$;

$3 \leqq m'+m''+n \leqq 8$;

if $n=0$, $m'+m'' \geqq 4$;

the R^3 groups are the same or different and are H, halogen, or hydrocarbyl or a substituted derivative thereof;

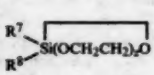
R^4 is hydrocarbyl, hydrocarbyloxy or a substituted derivative thereof; or R^4 is

wherein R^5 and R^6 are the same or different and are H or hydrocarbyl or a substituted derivative thereof;

R^{15} is H or hydrocarbyl or a substituted derivative thereof;

the calixarene or oxacalixarene derivative being present as a compound per se or being bound into the polymer network of the polymeric material;

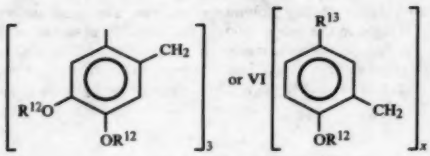
(B) Silacrowns represented by the formula



III

wherein R^7 and R^8 are the same or different and are hydrocarbyl, hydrocarbyloxy, or a nitrogen-substituted or other substituted derivative thereof; z is 3–6; and

(C) polyalkylene ether derivatives represented by the formulae



V or VI

wherein

R^{12} is $—(R^{10}—O)_q—R^{11}$;

q is an integer of from 2 to 25;

R^{10} is a substituted or unsubstituted alkyl residue having 2 to 6 carbon atoms, the $(R^{10}—O)$ groups containing the same alkyl residue or containing different alkyl residues distributed on the chain in a random or block manner;

R^{11} is hydrogen, hydrocarbyl or a substituted derivative thereof;

R^{13} is hydrogen, halogen, or hydrocarbyl or a substituted derivative thereof; and

x is an integer from 4 to 8.

4,908,400
PLASTICIZER FOR CHLOROPRENE RUBBER AND PLASTICIZED CHLOROPRENE RUBBER

Yasushi Hirose, Urawa; Kenji Iijima, Tokyo; Humihiro Kashima, Kawasaki; Naoyasu Kurita, Urawa; Koji Tajima, Urawa, and Hiroshi Hondou, Urawa, all of Japan, assignors to Du Pont-Showa Denko Co., Ltd. and Adeka Argus Chemical Co., Ltd., both of Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,707

Claims priority, application Japan, Feb. 16, 1987, 62-33040

Int. Cl.[4] C08K *5/36;* **C08L** *27/00;* **C08H** *3/00;* **C08J** *3/18*

U.S. Cl. 524—303 **9 Claims**

1. A plasticizer for chloroprene rubber comprising a diester of a glycol having a thioether bond with aliphatic monocarboxylic acid(s) represented by the following formula (I):

$$R_1(O—R)_mS(R—O)_nR_2 \quad (I)$$

wherein

R_1 is an unsaturated aliphatic monoacyl group having 4 to 24 carbon atoms;

R_2 is a saturated or unsaturated aliphatic monoacyl group having 4 to 24 carbon atoms;

R represents an alkylene group having two to four carbon atoms; and

m and n each represent an integer of 1 to 4.

4,908,401
RUBBER COMPOSITION FOR TIRE TREAD

Riichiro Ohara, Suita; Satoshi Iwama, Ibaraki; Eiji Ida, Takatsuki, and Noriyuki Isobe, Ibaraki, all of Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 925,211, Oct. 31, 1986, abandoned. This application Dec. 21, 1988, Ser. No. 287,257

Claims priority, application Japan, Nov. 9, 1985, 60-251783

Int. Cl.[4] C08K *3/04;* **C08L** *7/00, 9/00, 53/02*

U.S. Cl. 524—495 **5 Claims**

1. A rubber composition comprising 40 to 100 parts by weight of carbon black per 100 parts by weight of a rubber component,

(a) the rubber composition being characterized in that the rubber component contains, in 100 parts by weight thereof, at least 20 parts by weight of a block copolymer prepared by solution polymerization and comprising one unit of butadiene rubber portion and one unit of random-copolymerized styrene-butadiene rubber portion, the butadiene rubber portion having a vinyl content of 15 to 50%, the styrene-butadiene rubber portion having a vinyl

content of 20 to 70% and a styrene content of 30 to 60%, the block copolymer having in its entirety a vinyl content of 15 to 60% and a styrene content of 5 to 30%, at least 40% of the copolymer being coupled with a tin compound so that the coupled copolymer has a butadiene rubber terminal, the coupled copolymer having only a single Tg at a temperature of up to −60° C.,

0 to 80 parts by weight of natural rubber, synthetic polyisoprene rubber, synthetic polybutadiene rubber, synthetic styrene-butadiene rubber, modified products of these rubbers, or mixtures thereof;

(b) the rubber composition being further characterized in that the carbon black has a specific surface area value (N_2SA) within the range of 75 to 105 as determined by the nitrogen adsorption method and is at least 15 in the difference between N_2SA and the iodine adsorption value (IA) thereof, up to 5 in the difference between N_2SA and the specific surface area value (CTAB) thereof as determined by the cetyltrimethylammonium bromide adsorption method, 90 to 110 in tint strength and up to −3 in the measured tint strength minus the calculated tint strength (Δtint).

4,908,402
REINFORCED RESIN COMPOSITION

Isao Sasaki; Kozi Nishida; Masaru Morimoto; Hisao Anzai, and Hideaki Makino, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Filed Jan. 28, 1988, Ser. No. 149,645
Int. Cl.[4] C08K 7/06
U.S. Cl. 524—495 8 Claims

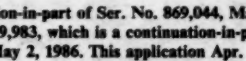
1. A reinforced resin composition for use in forming molded and extruded products which comprises 50–95% by weight of polyglutarimide resin and 5–50% by weight of carbon fibers.

4,908,403
PRESSURE SENSITIVE ADHESIVES OF ACETOACETOXY-ALKYL ACRYLATE POLYMERS

Lon T. Spada, Walnut, and Joseph J. Wilczynski, Yorba Linda, both of Calif., assignors to Union Oil of California, Brea, Calif.

Continuation-in-part of Ser. No. 869,044, May 30, 1986, Pat. No. 4,759,983, which is a continuation-in-part of Ser. No. 859,057, May 2, 1986. This application Apr. 7, 1988, Ser. No. 178,499
Int. Cl.[4] C08K 5/51, 5/16
U.S. Cl. 524—818 67 Claims

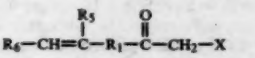
1. A normally tacky composition comprising (I) a polymer having a Tg of about 0° C. or less and containing at least one polymerized functional monomer of formula A:



(A)

wherein the composition is a pressure sensitive adhesive and R_1 is a divalent organic radical of at least 3 atoms in length; R_5 and R_6 are independently selected from the group consisting of hydrogen, hydroxy, halo, thio, amino and monovalent organic radicals; X is —CO—R_4 or —CN; R_4 is hydrogen or a monovalent organic radical; and (II) a polyacid component comprising (a) at least one aminopolycarboxylic acid selected from the group consisting of ethylenediaminetetraacetic acid; N-hydroxyethylethylenediaminetriacetic acid, nitrilotriacetic acid, iminodiaxetic acid, methyliminodiacetic acid, diethylenetriaminepentaacetic acid, and 1,2-diaminocyclohexanetetraacetic acid or salt thereof or (b) at least one aminopolyphosphonic acid or salt thereof.

10. A water-based latex comprising a continuous aqueous medium having dispersed therein (I) a polyacid component selected from the group consisting of (a) polyphosphonic acids, (b) polycarboxylic acids, (c) mixtures of (a) and (b), and (d) salts of (a), (b), and (c), and (II) particles of a polymer having a Tg of about 0° C, or less and comprising at least about 0.1 weight percent of at least one polymerized functional monomer of formula A:



(A)

in which R_1 is a divalent organic radical of at least 3 atoms in length, R_5 and R_6 are independently selected from the group consisting of hydrogen, hydroxy, halo, thio, amino and monovalent organic radicals, and X is —CO—R_4 or —CN wherein R_4 is hydrogen or a monovalent organic radical, wherein upon evaporation of the aqueous medium the latex forms a pressure-sensitive adhesive composition having a cohesive strength under acidic conditions at least about two times greater than the cohesive strength of a composition having substantially identical ingredient but substantially devoid of the polyacid component.

4,908,404
SYNTHETIC AMINO ACID-AND/OR PEPTIDE-CONTAINING GRAFT COPOLYMERS

Christine V. Benedict, and Nishith Chaturvedi, both of Farmington, Conn., assignors to BioPolymers, Inc., Farmington, Conn.

Filed Aug. 22, 1988, Ser. No. 234,896
Int. Cl.[4] C08H 89/00; C08L 37/00
U.S. Cl. 525—54.11 26 Claims

1. A water-soluble cationic peptide-containing graft copolymer exhibiting a number average molecular weight of from about 30,000 to about 500,000 comprising:

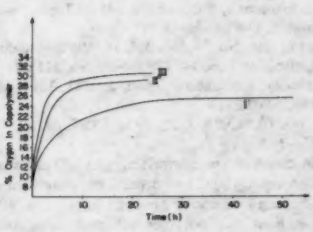
(a) a polymeric backbone containing or capable of modification to include free primary or secondary amine functional groups for reaction with an amino acid or peptide graft, said polymeric backbone exhibiting a number average molecular weight of from about 10,000 to about 250,000; and

(b) an amino acid or peptide graft reacted with from at least 5% to about 100% of said primary or secondary amine functional groups of said polymeric backbone, wherein said amino acid or peptide graft comprises at least one 3,4-dihydroxyphenylalanine (Dopa) amino acid or a precursor thereof capable of hydroxylation to the Dopa form.

4,908,405
GRAFT COPOLYMERS OF CROSSLINKED POLYMERS AND POLYOXYETHYLENE, PROCESSES FOR THEIR PRODUCTION, AND THEIR USAGE

Ernst Bayer, Bei der Ochsenweide, D-7400 Tubingen, and Wolfgang Rapp, Stuttgart, both of Fed. Rep. of Germany, assignors to Ernst Bayer, Tubingen, Fed. Rep. of Germany

Filed Jan. 2, 1986, Ser. No. 815,634
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1985, 3500810
Int. Cl.[4] C08F 8/00
U.S. Cl. 525—61 9 Claims



1. A graft copolymer comprising a polymer having a degree

of crosslinking of 0.05 to 10%, selected from the group consisting of a polyvinyl alcohol, a polyhydroxystyrene, a polymer produced from chloromethylated polystyrene and ethylene glycol, a polymer produced from chloromethylated polystyrene and oligoethylene glycols, a polyacrylate functionalized by hydroxy groups, and a polymethacrylate functionalized by hydroxy groups which contains polyoxyethylene chains which have an average molecular weight of 500 to 40,000;

said copolymer containing 0.02 to 15 meq free hydroxy groups per gram of copolymer, and being obtained by reacting the crosslinked polymer with ethylene oxide.

4,908,406

CURABLE MIXTURE

Ralf Mülhaupt, Marly, Switzerland; Hubert Simon, Mulhouse, France, and Jacques-Alain Cotting, Düdingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,112

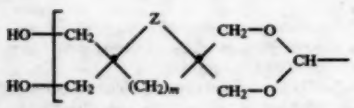
Claims priority, application Switzerland, Jan. 14, 1988, 125/88-4

Int. Cl.[4] C08B *18/10*

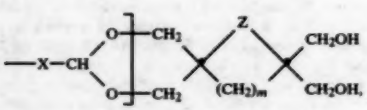
U.S. Cl. 525—64 **11 Claims**

1. A curable mixture, comprising

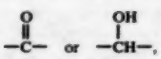
(a) a cycloaliphatic polyol of the formula I



(I)



in which Z is



m is a number from 2 to 5, n is zero or a number from 1 to 10 and X is a direct bond or an aliphatic or cycloaliphatic radical, and

(b) a prepolymeric polyhydroxy compound blocked by an aliphatic or cycloaliphatic diisocyanate.

4,908,407

RESIN COMPOSITIONS

Yoshinari Ogawa, Sagamihara; Seiichi Yamashiro, Kodaira, and Katsuhiko Hironaka, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

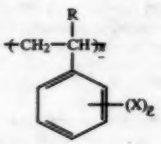
Continuation of Ser. No. 74,265, Jul. 16, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 311,371

Claims priority, application Japan, Jul. 21, 1986, 61-169870; Aug. 20, 1986, 61-192914

Int. Cl.[4] C08K *3/22, 7/14*; C08L *63/02*

U.S. Cl. 525—113 **9 Claims**

1. A resin composition comprising (A) 100 parts by weight of a nylon-4,6 resin, (B) 0.1 to 3 parts by weight of an epoxy compound having two epoxy groups and (C) 3 to 40 parts by weight of at least one polymer selected from halogenated polystyrenes and halogenated poly-alpha-methylstyrenes, represented by the following general formula (I)



(I)

(wherein R is a hydrogen atom or a methyl group; X is a bromine or chlorine atom; p is an integer of 1 to 5; and n is an integer of 2 or more).

4,908,408

HOT MELT ADHESIVE CONTAINING HYDROXYL-FUNCTIONAL ETHYLENE-VINYL ACETATE AND BLOCKED POLYISOCYANATE

Jacques Boutillier, Carsix; Noelle Forichon, Le Neubourge, and Yves Lermat, Fontaine l'Abbé, all of France, assignors to Atochem, Puteaux, France

Filed Jun. 3, 1988, Ser. No. 202,103

Claims priority, application France, Jun. 5, 1987, 8707954

Int. Cl.[4] C08L *23/08, 31/04*

U.S. Cl. 525—124 **6 Claims**

1. A composition for a cross-linkable hot melt adhesive having a base of ethylene-vinyl acetate copolymer, consisting essentially of a blocked polyisocyanate associated with an ethylene-vinyl acetate copolymer that possesses primary hydroxyl functions contributed by an ethylenic monomer having at least one primary hydroxyl function and wherein said polyisocyanate is blocked by a tackifying resin having free phenolic functions.

4,908,409

POLYIMIDE

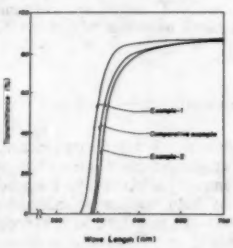
Hideaki Oikawa, Yokohama; Katsuaki Liyama, Odawara; Nobuhito Koga, Yokohama; Saburo Kawashima, Yokosuka; Shoji Tamai; Masahiro Ohta, both of Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 119,042

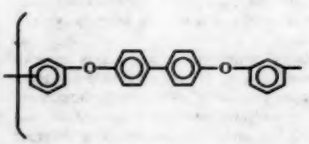
Claims priority, application Japan, Nov. 19, 1986, 61-274206

Int. Cl.[4] C08G *69/26*

U.S. Cl. 528—188 **1 Claim**

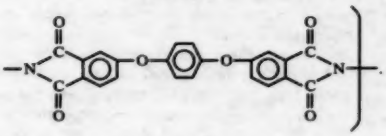


1. Polyimide having a recurring unit of the formula:



(I)

-continued



4,908,410

MODIFIED POLYTETRAFLUOROETHYLENE FINE POWDER AND PREPARATION THEREOF

Satish C. Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jan. 27, 1989, Ser. No. 302,759
Int. Cl.[4] C08F 25/00, 16/24; C08L 83/00
U.S. Cl. 525—276 8 Claims

1. A modified dispersion-process-produced polytetrafluoroethylene fine powder composition comprising a core portion having a copolymer comprising repeat units provided by a tetrafluoroethylene monomer and repeat units provided by at least one copolymerizable monomer of the formula

wherein X and X' are selected from the group consisting of F, Cl and H, and Y is selected from the group consisting of

wherein Z and Z' are selected from the group consisting of F, alkyl units having from 1 to 6 carbon atoms, and fluorinated alkyl units having from 1 to 6 carbon atoms, and a shell portion that is substantially free of dioxole units.

4,908,411

MODIFIED ETHYLENIC RANDOM COPOLYMER

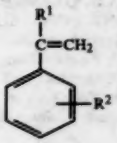
Tatsuo Kinoshita, Yamaguchi, and Syuji Minami, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 144,709, Jan. 14, 1988, abandoned, which is a continuation of Ser. No. 800,132, Nov. 20, 1985, abandoned. This application May 1, 1989, Ser. No. 346,335
Claims priority, application Japan, Nov. 22, 1984, 59-246330; Apr. 15, 1985, 60-78461; Apr. 25, 1985, 60-87477
Int. Cl.[4] C08F 255/04
U.S. Cl. 525—285 16 Claims

1. A modified ethylenic random copolymer derived from 100 parts by weight of a base ethylenic random copolymer composed of 25 to 75 mole % of ethylene and 75 to 25 mole % of an alpha-olefin having 3 to 20 carbon atoms and grafted thereto,

a 0.2 to 50 parts by weight of an unsaturated carboxylic acid having 3 to 10 carbon atoms or an anhydride or ester thereof,

(b) 0.2 to 200 parts by weight of a styrene-type hydrocarbon having 8 to 12 carbon atoms and represented by the formula



wherein R^1 and R^2, independently from each other, represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, or

(c) 0.2 to 300 parts by weight of an unsaturated silane compound represented by the formula

wherein one or two of R^3, R^4, R^5 and R^6 represent a vinyl or allyl group, and the remainder represent a hydrogen atom, a lower alkyl group, a lower alkoxy group, a lower alkanoyl group, a lower alkoxyalkoxy group, an aryl group, an aryloxy group, an aralkyl group, or an aralkoxy group, provided that the total number of carbon atoms of R^3, R^4, R^5 and R^6 is in the range of 2 to 20,

said modified ethylenic random copolymer having an intrinsic viscosity (η), measured in decalin at 135° C., of 0.01 to 1.5 dl/g and a molecular weight distribution ($\overline{M}w/\overline{M}n$), measured by gel permeation chromatography, of not more than 4; and said base ethylenic random copolymer being liquid and having

(i) a number average molecular weight ($\overline{M}n$) of 200 to 10,000,

(ii) a molecular weight distribution ($\overline{M}w/\overline{M}n$), measured by gel permeation chromatography, of not more than 4,

(iii) a Z value of 10 to 300, and

(iv) a σ value of 0 to 2.

4,908,412

THERMOPLASTIC ELASTOMER COMPOSITION EXCELLENT IN HEAT BONDABILITY

Yasuhiko Otawa; Toshiyuki Maeda; Kunihide Hiraoka, all of Ichihara, and Katsuo Okamoto, Funabashi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 114,026, Oct. 29, 1987, abandoned. This application Jul. 12, 1989, Ser. No. 377,803
Claims priority, application Japan, Oct. 29, 1986, 61-255915; Oct. 29, 1986, 61-255916
Int. Cl.[4] C08F 269/00, 277/00, 265/04; C08L 45/00
U.S. Cl. 525—286 42 Claims

1. A thermoplastic elastomer composition comprising a blend comprising (a) 10 to 100 parts by weight of a peroxide-crosslinking olefin copolymer rubber, (b) 0 to 90 parts by weight of an olefinic plastic, the sum of the amounts of the components (a) and (b) being 100 parts by weight, and (c) 0.01 to 10 parts by weight of an unsaturated hydroxy monomer, said thermoplastic elastomer composition being partially cross-linked by dynamically heat-treating said blend in the presence of an organic peroxide.

4,908,413

PREPARATION OF COPOLYMERS OF MONOALKYL MALEATES AND VINYL ALKYL ETHERS

Hans-Helmut Goertz, Freinsheim; Ferdinand Straub, Hockenheim; Friedrich Vogel, Wachenheim; Franz Frosch, Ludwigshafen; Paul Naegele, Otterstadt, and Hans-Juergen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 251,754

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733158

Int. Cl.[4] C08F *20/08, 22/04*

U.S. Cl. 525—304 **11 Claims**

1. A process for the preparation of a copolymer of a monolower alkyl maleate and a vinyl lower alkyl ether followed by reaction with a lower alkanol, which comprises reacting maleic anhydride with a molar excess of a vinyl lower alkyl ether in each phase of polymerization, wherein said polymerization is carried out in acetone, said acetone being removed by distillation either during or after product ester formation at up to about 70° C., and further wherein said molar excess of vinyl lower alkyl ether is from a molar excess sufficient to achieve substantially complete conversion of maleic anhydride to up to about 15 mol%.

4,908,414

PREPARATION OF IMPACT-RESISTANT POLY(ALKYL)STYRENE

Klaus Bronstert, Carlsberg; Hans Hoenl, Obersuelzen; Adolf Echte, Ludwigshafen, and Peter Klaerner, Battenberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 30,482, Mar. 27, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,568

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611704

Int. Cl.[4] C08F *279/02*

U.S. Cl. 525—316 **6 Claims**

1. Impact-resistant translucent rubber-modified polystyrene as obtained by a process comprising: continuously polymerizing a reaction batch containing 70 to 97% by weight of styrene and 3 to 30% by weight of a rubbery polymer, said rubbery polymer being based on more than 80% conjugated diene, having an average molecular weight of from 20,000 to 200,000, as measured by gel permeation chromatography, and conforming to the formula $P\text{-}(SH)_x$, where x denotes the number of thiol groups per rubber molecule and is an integer from 1 to 5 and P is a polymer of more than 80% conjugated dienes of 4 or 5 carbon atoms, in the presence or absence of a solvent, with the application of heat or in the presence of free radical initiators and while stirring for from 5 to 20 hours until an end conversion of from 70 to 95%, based on the monomer, is achieved, stirring being carried out in such a way that, on completion of the polymerization, the grafted rubber particles which represent the flexible phase of the product are dispersed in the resulting polystyrene and have an average particle diameter of from 0.1 to 0.8 μm.

4,908,415

METHOD OF CONVERTING FLUORINE-CONTAINING POLYMER INTO LOWER MOLECULAR WEIGHT POLYMER

Minoru Aramaki; Hisazi Nakano, and Masahiro Kubo, all of Ube, Japan, assignors to Central Glass Company, Ltd., Ube, Japan

Filed Dec. 2, 1987, Ser. No. 127,361

Claims priority, application Japan, Dec. 2, 1986, 61-285962

Int. Cl.[4] C08F *8/50*

U.S. Cl. 525—356 **11 Claims**

1. A method of converting a fluorine-containing solid polymer into a lower molecular weight polymer in the form of fine particles, comprising the steps of:

heating a fluorine-containing solid polymer in a reactor to a temperature not lower than the melting temperature of the fluorine-containing polymer and not higher than 600° C. and subjecting the heated fluorine-containing polymer to contact reaction with a fluorinating gas while maintaining the gas phase in the reactor at a temperature in the range from 200° to 550° C. such that a lower molecular weight polymer is formed by reaction of the fluorinating gas with the fluorine-containing polymer and a major portion of the lower molecular weight polymer exists as a gas phase in a hot reaction gas produced by the contact reaction, said fluorinating gas comprising at least one fluorine source material selected from the group consisting of molecular fluorine, nitrogen trifluoride, halogen fluorides and fluorides of rare gas elements;

extracting said hot reaction gas from the reactor; and

cooling the extracted reaction gas to a temperature not higher than 100° C. thereby precipitating submicron particles of the lower molecular weight polymer from the reaction gas.

4,908,416

MIXTURES OF AROMATIC POLYCARBONATES AND/OR AROMATIC POLYESTERS WITH SPECIAL COPOLYMERS

Edgar Leitz; Herbert Eichenauer, both of Dormagen, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,975

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808837

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—411 **9 Claims**

1. Mixtures containing

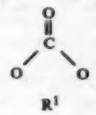
(I.) 10 to 98 parts by weight of thermoplastic aromatic polycarbonates or thermoplastic aromatic polyester or a mixture of both and

(II.) 90 to 2 parts by weight of copolymers corresponding to formula (Ia)

$$—A—X—B]_r \qquad \text{(Ia)}$$

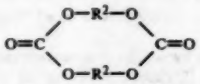
in which r is an integer of 1 to 20,

—A— represents polymers of cyclic carbonates corresponding to formula (v)



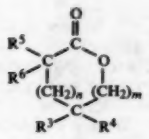
(V)

or to formula (VI)



or to formula (v) and (VI),

—B— represents polymers of lactones corresponding to formula (VII)



(VII)

and

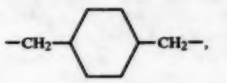
—X— represents polymers containing at least one of the carbonates (V) or (VI) together with the lactones (VII) in polymerized form, the concentration of the polymerized carbonates (V) and (VI) decreasing continuously towards the blocks —B— and the concentration of the polymerized lactones (VII) decreasing continuously towards the blocks —A— ("tapered structure") and the sum of the parts by weight of components (I) and (II) amounting to 100 parts by weight;

R^1 in (V) is a linear C_3–C_{10} alkylene or a moiety corresponding to formulae (a) to (l)

(a) $—CH_2CH_2CH(CH_3)—$

(b) $—CH_2CH_2OCH_2CH_2OCH_2CH_2—$,

(c) $—CH_2CH(CH_3)CH_2OH_2C(CH_3)_2CH_2—$,



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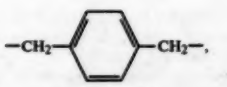

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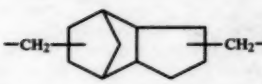

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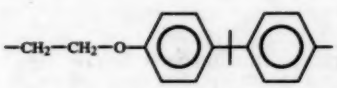
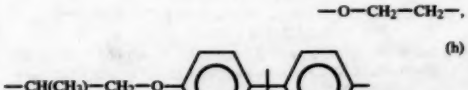
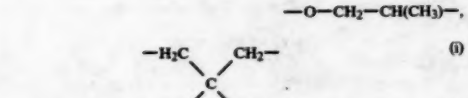


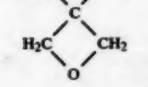
(g)



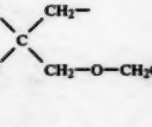


(h)

(i)



(j)



(k)

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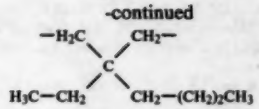


(l)

R^2 in (VI) is a linear C_4–C_{12} alkylene or a moiety corresponding to formulae (m) or (b)

(m) $—CH_2—CH_2—O—CH_2—CH_2—$ or

(b) $—CH_2—CH_2—O—CH_2—CH_2—O—CH_2—CH_2—$ and

R^3, R^4, R^5 and R^6 in (VII) are the same or different and each represents H, C_1–C_6 alkyl, C_3–C_6 alkylene, C_1–C_6 alkoxy or C_2–C_6-alkyleneoxy-C_1–C_6-alkyl, and

m and n in (VII) independently of one another are 0, 1, 2, 3, 4, 5 or 6.

4,908,417

THERMOSETTING RESIN COMPOSITION

Yutaka Shiomi, Hirakata; Kunimasa Kamio, Suita; Satoru Haraguchi, Toyonaka, and Shigeki Naitoh, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 2, 1989, Ser. No. 347,157

Claims priority, application Japan, May 17, 1988, 63-121372

Int. Cl.[4] C08F 283/04

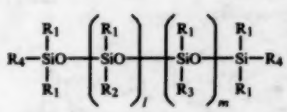
U.S. Cl. 525—422 **18 Claims**

1. A thermosetting resin composition which comprises

(A) a phenol novolak resin having hydroxy groups and allyl-etherified hydroxy groups,

(B) a polymaleimide compound having two or more maleimide groups in the molecule, and

(C) at least one silicone resin having the following formula (I);



(I)

wherein R_1 and R_2, which may be the same or different, are methyl or phenyl; R_3 and R_4,which may be the same or different, are methyl, phenyl, hydrogen or a group having an amino group or an epoxy group but at least one of R_3 and R_4 is hydrogen or a group having an amino group or an epoxy group; and l and m, which may be the same or different, are a number of 0-400.

4,908,418

TERNARY POLYMER BLENDS

Fred F. Holub, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 29, 1982, Ser. No. 344,007

Int. Cl.[4] C08L 67/02, 69/00, 79/08

U.S. Cl. 525—425 **14 Claims**

1. A composition comprising a blend of (a) a polyarylate which is derived from at least one dihdyric phenol and at least one aromatic dicarboxylic acid, (b) a polyetherimide and (c) a thermoplastic polymer which is compatible with the blend of the polyarylate and the polyetherimide.

4,908,419

POLYETHERIMIDE-POLYARYLATE, BLENDS

Fred F. Holub, Schenectady, N.Y., and William R. Schlich, Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 29, 1982, Ser. No. 344,012
Int. Cl.[4] C08L 67/02, 79/08
U.S. Cl. 525—423 8 Claims

1. A molding composition comprising a blend of (a) a polyarylate derived from at least one dihydric phenol and at least one aromatic dicarboxylic acid; and (b) a polyetherimide.

4,908,420

METHOD FOR PREPARING RESIN HAVING LIGHT COLOR

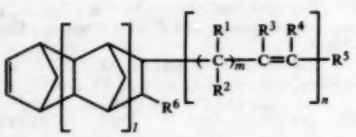
Makoto Sasaki, Yokohama; Yukio Kobayashi, and Shozo Tsuchiya, both of Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 383,007
Claims priority, application Japan, Jul. 27, 1988, 63-185427
Int. Cl.[4] C08F 32/04, 32/08
U.S. Cl. 526—76 17 Claims

1. A method for preparing a resin having light color comprising the steps of:

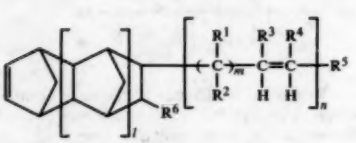
hydrogenating a compound represented by the formula (1)

(1)



wherein l, m and n are integers of $0 \leqq l \leqq 3$, $0 \leqq m \leqq 8$ and $1 \leqq n \leqq 3$, respectively, and R^1 to R^6 each represent a hydrogen atom or a hydrocarbon residue having 1 to 3 carbon atoms, with or without R^5 and R^6 forming a ring, in the presence of a Ziegler catalyst containing a transition metal compound of the groups IV to VI of the Periodic Table and an organometallic compound of the groups I to III of the Periodic Table in combination to obtain a norbornene compound represented by the formula (2)

(2)



wherein l, m, n and R^1 to R^6 are the same as above;

polymerizing the norbornene compound to give said resin having light color.

4,908,421

PRODUCTION OF TERMINALLY FUNCTIONAL POLYMER BY CATIONIC POLYMERIZATION

Munmaya K. Mishra, Akron, Ohio, and Akhtar Osman, Clearwater, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Jul. 26, 1988, Ser. No. 224,370
Int. Cl.[4] C08F 4/14, 4/34, 10/10
U.S. Cl. 526—147 22 Claims

1. A living cationic polymerization process for producing a terminally functional polymer which comprises introducing into a suitable reaction vessel a monomer charge, an organic peroxy compound and a Lewis acid, said Lewis acid being introduced last, and polymerizing the monomer charge at a temperature of from about 0° to about −80° C. to form said terminally functional polymer, wherein said monomer charge comprises isobutylene and said organic peroxy compound is charged in an amount of from 10^{-4} to about 10^{-1} moles per mole of said isobutylene.

4,908,422

THERMOPLASTIC MOLDING COMPOUNDS CONTAINING ALIPHATIC POLYCARBONATES

Edgar Leitz; Herbert Eichenauer, both of Dormagen; Karl-Heinz Ott, Leverkusen; Thomas Eckel, Dormagen; Horst Peters, Leverkusen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,966
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808840
Int. Cl.[4] C08L 69/00
U.S. Cl. 527—67 10 Claims

1. Thermoplastic molding compounds containing

(1.) thermoplastic aromatic polycarbonates, thermoplastic aromatic polyesters or mixtures thereof,

(2.) graft polymers obtained by grafting of

(2.1.) 5 to 90 parts by weight of a mixture of

(2.1.1.) 50 to 95 parts by weight styrene, α-methylstyrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof and

(2.1.2.) 50 to 5 parts by weight acrylonitrile, methacrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide or mixtures thereof onto

(2.2.) 95 to 10 parts by weight of a rubber having a glass temperature T_G of $<10°$ C., and, optionally,

(2.a) thermoplastic copolymers obtained by copolymerization of

(2.a.1.) 50 to 95 parts by weight styrene, α-methylstyrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof with

(2.a.2.) 50 to 5 parts by weight acrylonitrile, methacrylonitrile, methyl methacrylate, N-substituted maleic imide or mixtures thereof,

characterized in they additionally contain aliphatic polycarbonates having weight average molecular weights Mw (as measured by ultracentrifugation or light scattering) in the range from 15,000 to 500,000.

4,908,423

ADVANCED EPOXIDE RESINS BASED ON CYCLOHEX-1-YLMETHYLENEDIPHENOL DERIVATIVES OR BICYCLO[2.2.1]HEPT-1-YLMETHYLENEDIPHENOL DERIVATIVES

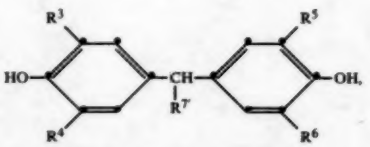
Martin Roth, Giffers, and Charles E. Monnier, Villars-sur-Glâne, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 147,389, Jan. 25, 1988, Pat. No. 4,808,740.
This application Nov. 14, 1988, Ser. No. 270,995
Claims priority, application Switzerland, Jan. 30, 1987, 352/87
Int. Cl.[4] C08G 59/62
U.S. Cl. 528—97 1 Claim

1. A process for curing a curable epoxide resin which comprises:

incorporating into the curable epoxide resin a compound of formula VIII

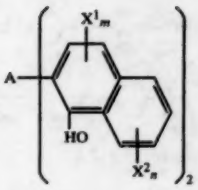
(VIII)

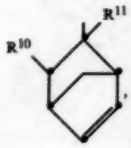


in which R^3, R^4, R^5 and R^6 independently of one another

are hydrogen, C_1–C_6-alkyl, chlorine or bromine, and R^7 is a radical of formula III, IV, V or VI

(III)





(IV)

(V)

(VI)

where R^8, R^{10}, R^{12} and R^{14} are hydrogen, C_1–C_6-alkyl or phenyl, and R^9, R^{11}, R^{13} and R^{15} are hydrogen or C_1–C_6-alkyl, and

subsequently curing the mixture at 50° C. to 300° C.

wherein X^1 and X^2 each independently is an alkyl group containing from 1 to 4 carbon atoms or a halogen atom having an atomic number of from 9 to 35, inclusive; M is 0, 1 or 2; n is 0, 1, 2, 3 or 4; and A is a divalent hydrocarbon radical selected from the group consisting of an alkylene group containing from 3 to 8 carbon atoms, or a divalent radical derived from a non-aromatic carbocyclic or a dialkyl carbocyclic aromatic or dialkyl non-aromatic carbocyclic group containing from 7 to 24 carbon atoms in which each alkyl group contains from 1–8 carbon atoms and the carbocyclic group comprises (a) a central non-aromatic carbocyclic ring containing 5 to 7 carbon atoms in a ring or (b) a central aromatic carbocyclic ring wherein the central ring of (a) or (b) may be bridged or fused with one or two non-aromatic or aromatic carbocyclic rings, and wherein the naphthol is directly attached to the alkyl substituent of the dialkyl carbocyclic group.

4,908,424

BIS-ANTHROLS AND BIS-NAPHTHOLS AND DIGLYCIDYL ETHERS THEREOF

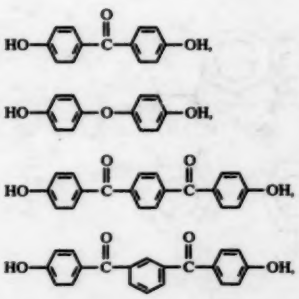
Kenneth C. Dewhirst, and Thomas G. Stewart, Jr., both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 107,618, Oct. 9, 1987, Pat. No. 4,843,011. This application Feb. 6, 1989, Ser. No. 306,415

Int. Cl.[4] C08G *59/08, 59/06*

U.S. Cl. 528—97 **18 Claims**

1. A curable composition comprising linear molecules which are the polymeric reaction product of (1) a bis-naphthol with a diglycidyl ether of a bis-phenol in the presence of base, or (2) a diglycidyl ether of a bis-naphthol with a bis-phenol in the presence of base, each of (1) and (2) with or without crosslinking and wherein the bis-naphthol has the formula



4,908,425

CHAIN-EXTENDED POLY(ARYL ETHER KETONES)

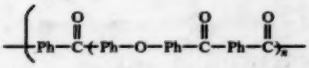
Lloyd M. Robeson, Whitehouse Station; Paul A. Winslow, Warren; Markus Matzner, Edison; James E. Harris, Piscataway, all of N.J., and Louis M. Maresca, Pittsfield, Mass., assignors to Amoco Corporation, Chicago, Ill.

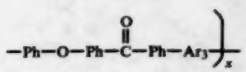
Filed Jun. 21, 1985, Ser. No. 747,188

Int. Cl.[4] C08G *8/02, 14/00*

U.S. Cl. 528—125 **8 Claims**

1. A poly(aryl ether ketone) of the following formula:





wherein n is 1 to 50, x is one or greater, Ar_3 is a residue of a dihydric phenol selected from the group consisting of O—Ph—O, O—Ph—Ph—O, O—Ph—SO_2—Ph—O, and O—Ar-$_4$—O, and AR_4 is the residue of one or more of the following:

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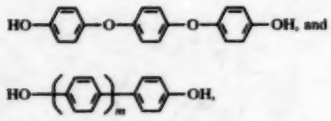


wherein m is an integer of 2 to 3.

4,908,426

POLYPHENYLQUINOXALINES VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

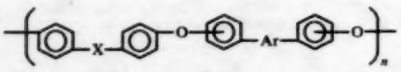
Paul M. Hergenrother, Yorktown, and John W. Connell, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1988, Ser. No. 250,661

Int. Cl.[4] C08G 73/06

U.S. Cl. 528—125 **12 Claims**

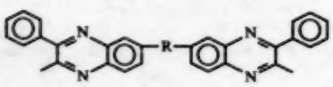
1. A poly(phenylquinoxaline) consisting of repeating units having the general structural formula



wherein the substitution of oxygen is selected from the group consisting of meta-meta, para-para, and para-meta;

wherein Ar is a radical selected from the group consisting of:

(A)

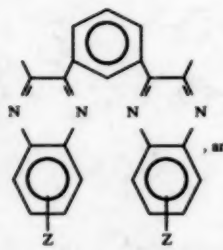


wherein R is a bond or is selected from the group consisting of:

O, S, C═O, SO_2, CH_2, $C(CH_3)_2$, *and* $C(CF_3)_2$;

(B)

(C)



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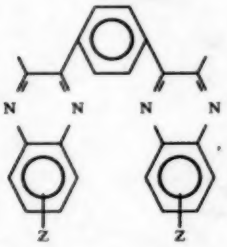
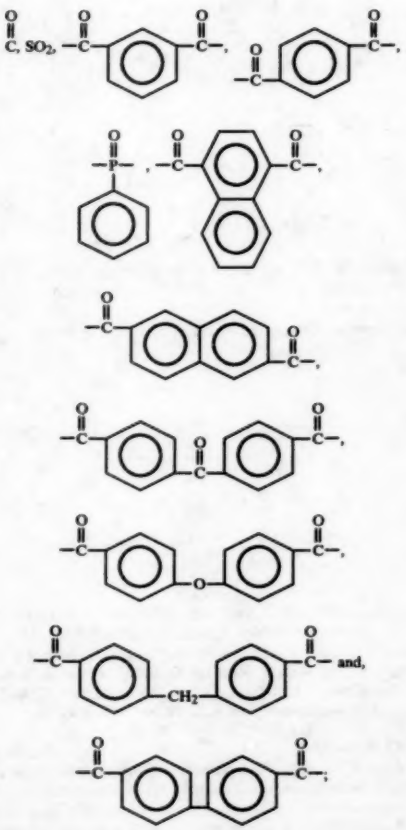
(D)



wherein Z is a substituent selected from the group consisting of: H, F, Cl, Br, CH_3, CH_2CH_3, OCH_3, C_6H_5, and C_6H_5O;

wherein X is a radical selected from the group consisting of:



and wherein n is an integer between 4 and 100.

4,908,427

POLYMER COMPOSITION

Shamsedin Rostami, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

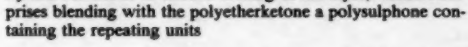
Continuation of Ser. No. 73,192, Jul. 14, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,489

Claims priority, application United Kingdom, Jul. 23, 1986, 8617989

Int. Cl.[4] C08G *8/02, 14/00;* H01B *3/42, 7/02*

U.S. Cl. 528—125 3 Claims

1. In an electrical conductor carrying a polyetherketone insulating layer, the improvement resulting in increased pliability and resistance to surface crazing of the layer, which comprises blending with the polyetherketone a polysulphone containing the repeating units



—Ph—SO_2—Ph—Ph—SO_2—Ph— I

and

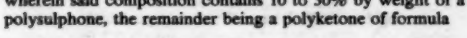
—Ar— II

(where

Ph is phenylene and

Ar is a divalent aromatic radical)

linked together through ether linkages and in a relative molar proportion of units I:units II in the range 25:75 to 50:50, wherein said composition contains 10 to 30% by weight of a polysulphone, the remainder being a polyketone of formula



—Ph—O—Ph—O—Ph—CO— IV.

4,908,428

QUICK-CRYSTALLIZING POLYESTER COMPOSITION

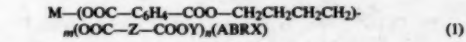
Catia Bastioli; Vittorio Bellotti, both of Novara, and Luciano Del Giudice, Milan, all of Italy, assignors to Montefibre S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 78,084, Jul. 27, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 323,369

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 9 Claims

1. Quick-crystallizing polyester compositions comprising a mixture consisting essentially of a polyester thermoplastic resin and a preformed nucleating agent selected from the class consisting of polymeric-base salts, or mixtures of salts, of alkali or alkaline-earth metals of the formula:



$M—(OOC—C_6H_4—COO—CH_2CH_2CH_2CH_2)_m(OOC—Z—COOY)_n(ABRX)$ (I)

wherein

M is an alkali or an alkaline-earth metal;

Y is a group selected from: $—CH_2CH_2—$, $—(CH_2)_4—$ or $—CH_2CH_2OCH_2CH_2—$;

Z is a group $—C_6H_4—$, or a group $—(CH_2)_q—$, q being an integer from 7 to 10;

A is an anion selected from the group consisting of carboxylate, sulphonate, sulphinate, phosphonate and phosphinate;

B is a direct bond or a group selected from the class consisting of $—CH=CH—$, $—CH_2—$ and $—CH_2CH_2—$;

R is an arylene radical containing from 1 to 3 aromatic rings directly linked with one another or condensed or bound by means of one of the following difunctional groups; —O—, —CO—, $—OCH_2CH_2O—$, $—SO_2—$, —NH—, $—C(CH_3)_2—$, or R is a thiophene or furane ring and, when A is a carboxylate and B is a direct bond, R may carry as a substituent at least one nitro, halogen, phenyl or oxyphenyl group;

X is a hydrogen atom or, when A is a carboxylate, B is a direct bond and R a substituted or unsubstituted phenyl ring, X is a —COOM group or a $—COO(CH_2)_4OH$ group;

m is an integer from 5 to 20; and

n is 0 or an integer from 1 to 5 said compositions being devoid of monomeric alkali or alkaline-earth terephthalates.

4,908,429

SPECIAL POLYIMIDES AS THERMOPLASTS

Wilfried Zecher, Leverkusen; Dieter Arlt, Cologne, and Aziz E. Sayed, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,452

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715890

Int. Cl.[4] C08G *69/26*

U.S. Cl. 528—353 6 Claims

1. Thermoplastic polyimides from 2,2-bis-phthalic acid anhydro-(4)-propane and 2,2-bis[4-aminophenoxyphenyl]-propane and optionally further diamines, acids or acid anhydrides.

4,908,430

USE OF SPECIAL POLYIMIDES AS CAST FILMS AND COATINGS

Wilfried Zecher, Leverkusen; Dieter Arlt, Cologne; Lutz Schrader, Krefeld, and Werner Waldenrath, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 189,211

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715891

Int. Cl.[4] C08G *69/26*

U.S. Cl. 528—353 7 Claims

1. Cast films or coatings comprising polyimide resins prepared by the reaction of 2,2-bisphthalic anhydrido-(4)-propane with 2,2-bis-(4-aminophenoxyphenyl)-propane, at temperatures of 0° to 400° C. and optionally in the presence of further diamines, acids or anhydrides.

4,908,431

MONOCLONAL ANTIBODIES TO HUMAN KININOGEN AND METHODS OF PREPARING SAME

Robert W. Colman, and Alvin H. Schmaier, both of Philadelphia, Pa., assignors to Temple University-of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Jan. 22, 1986, Ser. No. 821,367

Int. Cl.[4] C07K *15/04;* C12N *5/00*

U.S. Cl. 530—387 15 Claims

1. A monoclonal antibody which specifically binds to an antigenic determinant of human kininogen, which antigenic determinant is characterized by binding to monoclonal antibody produced by hybridoma ATCC #HB-8963 or ATCC #HB-8964.

4,908,432

NOVEL POLYPEPTIDE HAVING GAMMA-INTERFERON ACTIVITY

Yum K. Yip, Forest Hills, N.Y., assignor to New York University, New York, N.Y.

Filed Jan. 9, 1987, Ser. No. 1,786

Int. Cl.[4] C07K *15/26, 13/00;* A61K *45/02;* C12P *21/00*

U.S. Cl. 530—351 11 Claims

1. A process for purifying a peptide having an amino acid sequence less than 100 amino acids, said peptide being immunochemically reactive with an antibody to gamma-interferon and having antiviral and cytolytic activities substantially the same as those of gamma-interferon, from an impure preparation comprising said peptide and also comprising gamma-interferon and other proteins as impurities; said process comprising the steps of:

subjecting said preparation to adsorption onto silicic acid thereby causing said gamma-interferon and said peptide to bind to said silicic acid;

desorbing said peptide and said gamma-interferon from said silicic acid;

subjecting said desorbate to anion exchange chromatography, thereby causing impurities to bind to said column while said peptide and said gamma-interferon are excluded in a portion of the chromatographic effluent;

subjecting said portion of said effluent to high-separation-speed molecular sieve chromatography under non-denaturing conditions thereby causing resolution of said gamma-interferon and said peptide;

recovering fractions containing said peptide;

subjecting said fractions containing said peptide to chromatography on a cation exchange residue, thereby causing said peptide to bind to said cation exchanger, and

eluting and recovering said peptide from said cation exchanger.

4,908,433

USES OF INTERLEUKIN-2

Roland Mertelsmann, Chappaqua; Karl Welte, New York, both of N.Y., and Salvatore Venuta, Napoli, Italy, assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 603,580, Apr. 25, 1984, Pat. No. 4,778,879, which is a continuation-in-part of Ser. No. 370,223, Apr. 20, 1982, abandoned. This application Jun. 10, 1988, Ser. No. 205,451

Int. Cl.[4] C07G *7/00*

U.S. Cl. 530—351 **21 Claims**

1. A method of normalizing a subject's immune response which comprises administering to the subject an amount of a human interleukin-2 effective to increase the proliferation of T cells and thus normalize the subject's immune response.

4,908,434

PROCESS FOR PREPARING PURIFIED INTERLEUKIN-2

Roland Mertelsmann, Chappaqua; Karl Welte, New York, both of N.Y., and Salvatore Venuta, Napoli, Italy, assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 603,580, Apr. 25, 1984, Pat. No. 4,778,879, which is a continuation-in-part of Ser. No. 370,223, Apr. 20, 1982, abandoned. This application Jun. 10, 1988, Ser. No. 205,172

Int. Cl.[4] C07K *3/28*

U.S. Cl. 530—417 **16 Claims**

1. A process for preparing a human interleukin-2 purified to apparent homogeneity comprising:

(a) treating human lympocytes so as to obtain a lymphocyte-conditioned medium which contains the human interleukin-2;

(b) separately recovering from the lymphocyte-conditioned medium the proteinaceous components thereof, including the human interleukin-2;

(c) subjecting the proteinaceous components so recovered to anion exchange chromatography so as to separate undesired, non-specific proteinaceous material from the human interleukin-2-containing proteinaceous components;

(d) subjecting the resulting human interleukin-2-containing proteinaceous material to gel filtration chromatography so as to recover the human interleukin-2 and other proteinaceous material of about the same molecular weight; and

(e) subjecting the human interleukin-2 and other proteinaceous material of about the same molecular weight to hydrophobic chromatography so as to obtain the human interleukin-2 purified to apparent homogeneity.

4,908,435

AROMATIC DISAZO COMPOUNDS HAVING STRONG INFRA-RED ABSORPTION

Peter Gregory, Bolton, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 12, 1988, Ser. No. 158,233

Claims priority, application United Kingdom, Feb. 27, 1987, 8704727

Int. Cl.[4] C09B *31/02, 31/04, 31/14*; D06P *1/18*

U.S. Cl. 534—761 **5 Claims**

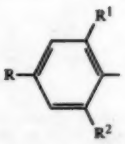
1. An azo compound of the formula:

$$A—N{=}N—B—N{=}N—D \qquad (P)$$

wherein:

A is selected from:

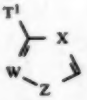
(i) a substituted phenyl group of the formula:



(i)

wherein: two of R, R^1 and R^2 are independently selected from NO_2, CN, CNS, 2,2-dicyanovinyl, 1,2,2-tricyanovinyl, SO_2CF_3, COCOT, COT, SO_2T, $CONT_2$ and SO_2NT_2, and the third is chosen from H, OH, C_{1-4}-alkyl, O—C_{1-4}-alkyl, NT_2, Cl, Br, CN, NO_2, CF_3, COT, SO_2T, $CONT_2$ and SO_2NT_2

(ii) an aromatic heterocycle of the formula:



(ii)

wherein:

Z is S, X is N, +N—T or C—T^2 and W is N, +N—T or C—T^3

Z is N or +N—T, X is S and W is N or +N—T;

or Z is N—T^4, X is N, +N—T or C—T^2 and W is N, +N—T or C—T^3;

T^1, T^2 and T^3 are each independently selected from H, CN, SCN, NO_2, F, Cl,

Br, C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-4}-alkoxy-C_{1-4}-alkyl, CF_3 CHO, CN—C_{1-4}-alkyl, SO_2CF_3, COCOT, COT, SO_2T, COOT, SO_2OT, $CONT_2$, SO_2NT_2, OCOT, OSO_2T, OCOOT, COCl, COF, COBr, SO_2Cl, SO_2F, SO_2Br;

or when X is C—T^2 or W is C—T^3,

T^1 and T^2 or T^3 together with the adjacent carbon atoms to which they are attached form a benzene or pyridine ring, fused to said aromatic heterocycle;

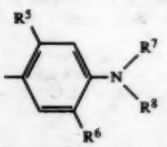
and T^4 is selected from H, C_{1-4}-alkyl, phenyl and benzyl;

(iii) pyrid-2-yl;

(iv) isothiazol-3-yl

(v) 2,1-benzoisothiazol-3-yl;

(vi) a group of the formula:



(vi)

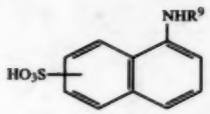
wherein

R^5 is selected from H, C_{1-4}-alkyl, O—C_{1-4}-alkyl and NHCOT;

R^6 is selected from H, C_{1-4}-alkyl and O—C_{1-4}-alkyl; and

R^7 and R^8 are independently selected from H, C_{1-4}-alkyl, aryl, C_{4-8}-cycloalkyl and C_{1-4}-alkyl, substituted by a group selected from OH, aryl, O—C_{1-4}-alkylene-O—C_{1-4}-alkyl, halogen, and O—C_{1-4}-alkyl;

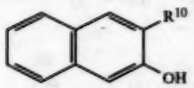
(vii) a substituted naphthylamine of the formula:



VII

wherein R^9 is phenyl or naphthyl either unsubstituted or substituted by a group selected from NO_2, CN, CNS, SO_2CF_3, COCOT, COT, SO_2T, $CONT_2$ and SO_2NT_2, and the third is chosen from H, OH, C_{1-4}-alkyl, O—C_{1-4}-alkyl, NT_2, Cl, Br, CN, NO_2, CF_3, COT, SO_2T, $CONT_2$ and SO_2NT_2;

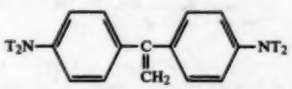
(viii) a group of the formula:



VIII

wherein R^{10} is selected from SO_3T, COOT, $CONT_2$ and SO_2NT_2;

(ix) a group of the formula:



IX

and (x) a group of the formula:

$$CH_3—CO—CH_2—CO—NH—R^9$$

X

wherein

R^9 is phenyl or naphthyl either unsubstituted or substituted by a group selected from NO_2, CN, CNS, SO_2CF_3, COCOT, COT, SO_2T, $CONT_2$ and SO_2NT_2, OH, C_{1-4}-alkyl, O—C_{1-4}-alkyl, NT_2, Cl, Br and CF_3 each T is independently selected from H, C_{1-4}-alkyl, phenyl and benzyl;

B is 3-cyanothiophen-2,5-ylene;

D is selected from the groups defined as vi to x in the definition of A.

4,908,436

FIBRE-REACTIVE AZO DYES CONTAINING VINYLSULFONYL GROUPS AND FURTHER ALIPHATIC FIBRE-REACTIVE RADICALS

Peter Scheibli, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

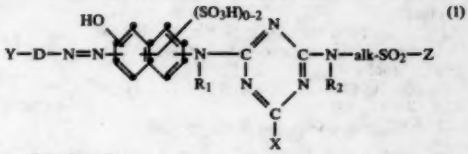
Continuation of Ser. No. 833,427, Feb. 24, 1986, abandoned, which is a continuation of Ser. No. 664,142, Oct. 24, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 921,849

Claims priority, application Switzerland, Oct. 26, 1983, 5795/83

Int. Cl.[4] **C09B** *62/04, 62/507, 62/527;* **D06P** *1/302*

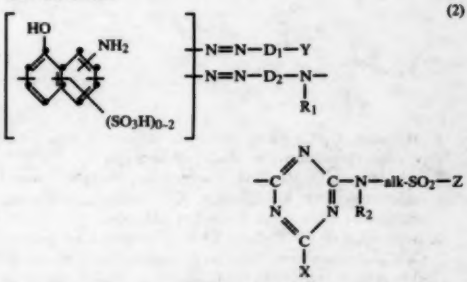
U.S. Cl. 534—637 **10 Claims**

1. A reactive dye of the formula



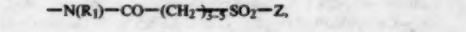
(1)

or of the formula



(2)

in which D, D_1 and D_2 are each phenylene or naphthylene unsubstituted or substituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, carboxylic acylamino having 1 to 8 carbon atoms, amino, alkylamino having 1 to 4 carbon atoms, phenylamino, N,N-di-β-hydroxyethylamino, N,N-di-β-sulfatoethylamino, sulfobenzylamino, N,N-disulfobenzylamino, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy radical, alkylsulfonyl having 1 to 4 carbon atoms, trifluoromethyl, nitro, cyano, halogen, carbamoyl, N-alkylcarbamoyl having 1 to 4 carbon atoms in the alkyl radical, sulfamoyl, N-alkylsulfamoyl having 1 to 4 carbon atoms, N-(β-hydroxyethyl)-sulfamoyl, N,N-di-(β-hydroxyethyl)-sulfamoyl, N-phenylsulfamoyl, ureido, hydroxyl, carboxyl, sulfomethyl, or sulfo, R_1 is hydrogen or C_{1-4}-alkyl unsubstituted or substituted by halogen, hydroxyl, cyano, C_{1-4}-alkoxy, methoxycarbonyl, ethoxycarbonyl, sulfamoyl, sulfato, carboxyl or sulfo, R_2 is (1) hydrogen, (2) alkyl unsubstituted or substituted by halogen, hydroxyl, cyano, alkoxy, methoxycarbonyl, ethoxycarbonyl, sulfamoyl, sulfato, carboxyl or sulfo, (3) cyclohexyl, (4) phenyl unsubstituted or substituted by methyl, ethyl, methoxy, ethoxy, chlorine, bromine, carboxyl, sulfo or sulfomethyl, or (5) a radical of the formula —alk—SO_2—Z, wherein alk is C_{2-6}-alkylene, Y is —SO_2—Z, —SO_2—N(R_1)—Z, —N—(R_1)—SO_2—Z,



$$—N(R_1)—CO—(CH_2)_{2-5}SO_2—Z,$$

—SO_2—F, —SO_2CH_2—CH=CH_2, —N(R-1)—CO—CBr=CH_2, —N(R_1)—CO—CHBr—CH_2Br, —N(R_1)—CO—CCl=CH_2, —N(R_1)—CO—CHCl—CH_2Cl, —N(R_1)—CO—CH_2Cl or —N(R_1)—CO—CH=CH_2, Z is —CH=CH_2 or —CH_2CH_2—A, A is —OSO_3H, —SSO_3H, —$OCOCH_3$, —OPO_3H_2, —Cl, —Br or —F, and X is fluorine, chlorine or hydroxyl.

4,908,437

THIEN-2-ONE COMPOUNDS WITH AN ALKYLIDENE OR IMINO GROUP IN THE 5-POSITION OF THE RING

Guenter Hansen, Ludwigshafen; Johannes P. Dix, Neuhofen; Helmut Reichelt, Niederkirchen, and Masahiro Hayashi, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

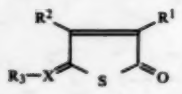
Filed May 17, 1988, Ser. No. 195,668

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716656

Int. Cl.[4] C09B *29/09;* **C07D** *333/32, 333/36, 333/38*

U.S. Cl. 534—738 **4 Claims**

1. A thienone compound of the formula



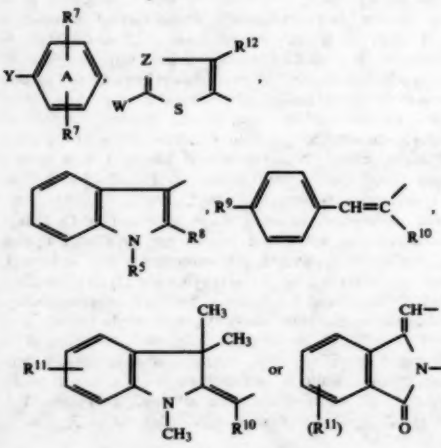
where

R^1 is cyano, C_1–C_4-alkoxycarbonyl, carbamoyl or C_1–C_4-monoalkylcarbamoyl or -dialkylcarbamoyl,

R^2 is hydrogen, C_1–C_8-alkyl, unsubstituted phenyl or phenyl substituted with C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or nitro, furyl, thienyl or halogen,

X is nitrogen or CR^4 where R^4 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl, cyano or unsubstituted phenyl or phenyl substituted with C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or nitro, and

R^3 is a radical of the formula



where the ring A is phenyl or naphthyl,

Y is NR^5R^6 or OR^8 where R^5 and R^6 are identical or different and each is independently of the other hydrogen, C_1–C_8-alkyl which is unsubstituted or substituted by hydroxyl, chlorine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyloxy or phenyl, allyl, C_5–C_7-cycloalkyl or phenyl or together with the nitrogen atom joining them are a 5- or 6-membered saturated heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino and N-(C_1–C_4-alkyl) piperazino and R^8 is C_1–C_4-alkyl or phenyl,

the R^7s are independently of one another hydrogen, chlorine, bromine, hydroxyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, unsubstituted or chlorine-, C_1–C_4-alkoxy- or phenoxy-substituted C_1–C_4-alkanoylamino, benzoylamino, C_1–C_4-mono- or -dialkylaminosulfonylamino, C_1–C_4-alkanoyloxy or phenylsulfonyloxy,

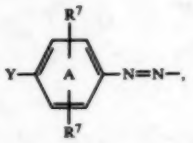
R^9 is hydrogen, C_1–C_4-dialkylamino or C_1–C_4-alkoxy,

R^{10} is hydrogen or cyano,

R^{11} is hydrogen, chlorine, bromine or C_1–C_4-alkyl,

R^{12} is hydrogen, chlorine, bromine, C_1–C_8-alkyl, unsubstituted phenyl or phenyl substituted with C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or nitro, or thienyl,

W is NR^5R^6 or



where R^5, R^6, R^7, Y and the ring A are each as defined above,

Z is nitrogen or CR^1 where R^1 is as defined above and

n is 1, 2, 3 or 4 with the proviso that if R^1 is cyano, X is CH and R^3 is 4-dimethylaminophenyl or styryl, then R^2 is not methyl or phenyl and that if R^1 is cyano, X is CH and R^3 is phenyl or 4-methoxyphenyl, then R^2 is not phenyl.

4,908,438

DAUNORUBICIN, DOXORUBICIN AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREFORE AS ANTI-RETROVIRAL AGENTS

Tsuneo Kuramochi, Tokyo, Japan, assignor to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,609

Claims priority, application Japan, Jun. 10, 1987, 62-145538

Int. Cl.[4] A61K *31/71*

U.S. Cl. 536—6.4 **3 Claims**

1. A method of treating feline leukemia virus cells comprising administering thereto an effective amount of a compound selected from the group consisting of daunorubicin, doxorubicin and pharmaceutically acceptable salts thereof.

4,908,439

SYNTHESIS OF INTERMEDIATE USEFUL IN THE PREPARATION OF NOJIRIMYCIN AND RELATED COMPOUNDS

Peter Anzeveno, Zionsville, Ind., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Sep. 16, 1988, Ser. No. 245,848

Int. Cl.[4] C07H *17/02*

U.S. Cl. 536—17.4 **4 Claims**

1. A process for preparing 5-amino-5-deoxy-1,2-O-isopropylidene-α-D-glucofuranose which comprises reducing 5-azido-azido-5-deoxy-1,2-O-isopropylidene-α-D-glucuronolactone with a hydride reducing agent selected from the group consisting of lithium aluminum hydride, lithium tri-t-butoxyaluminum hydride, and isobutylaluminum hydride.

4,908,440

2',3'-DIDEOXY-2'-FLUOROARABINOPYRIMIDINE NUCLEOSIDES

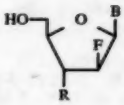
Roman Z. Sterzycki, Madison; Muzammil M. Mansuri, and John C. Martin, both of Cheshire, all of Conn., assignors to Bristol Myers Company, New York, N.Y.

Filed Nov. 12, 1987, Ser. No. 120,051

Int. Cl.[4] C07H *19/00*

U.S. Cl. 536—23 **5 Claims**

1. The compound having the formula



wherein B is selected from

[2,4-dihydroxypyrimidin-1-yl] uracil-1-yl

[5-methyl-2,4-dihydroxypyrimidin-1-yl] thymin-1-yl

[5-ethyl-2,4-dihydroxypyrimidin-1-yl] 5-ethyl uracil-1-yl

[2-hydroxy-4-aminopyrimidin-1-yl] cytosin-1-yl

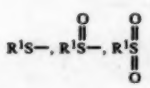
[5-vinyl-2,4-dihydroxypyrimidin-1-yl 5-vinyluracil-1-yl

[5-halovinyl-2,4-dihydroxypyrimidin-1-yl] 5-halovinyluracil-1-yl

[5-halomethyl-2,4-dihydroxypyrimidin-1-yl] 5-halomethyluracil-1-yl

[5-haloethyl-2,4-dihydroxypyrimidin-1-yl] 5-haloethyluracil-1-yl

said halovinyl, halomethyl, and haloethyl groups containing from 1 to 4 F, Cl, or Br atoms and wherein R is selected from hydrogen, azido, cyano, cyanamido, F, Cl, Br, amino, alkylamino, dialkylamino,



wherein R^1 is alkyl having 1 to 3 carbon atoms, phenyl, or tolyl.

4,908,441

DEOXYADENOSINE COMPOUNDS AND METHODS OF MAKING AND USING THE SAME

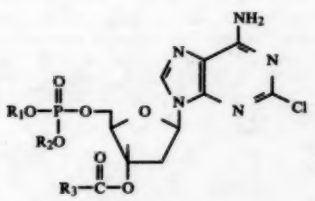
Phillip D. Cook, Downingtown, Pa., and Dennis J. McNamara, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 19, 1988, Ser. No. 221,478

Int. Cl.[4] C07H *19/173, 19/20*

U.S. Cl. 536—27 **4 Claims**

1. A compound having the structural formula



where R_1 and R_2 each independently represent H, NH_4, an alkali metal or a C_1 to C_8 alkylamine or together represent an alkaline earth metal, and R^3 is a C_1 to C_8 alkyl group.

4,908,442

TETRA KETONE PORPHYRIN MONOMERS AND THE PROCESS OF PREPARATION THEREOF

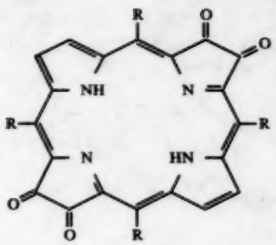
Subhash C. Narang, Redwood City, and Susanna Ventura, Sunnyvale, both of Calif., assignors to General Petrochemical Industries, Limited, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 247,590

Int. Cl.[4] C07D *487/22*

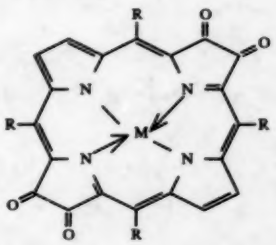
U.S. Cl. 540—145 **14 Claims**

1. A tetraketone of structure:



I

or

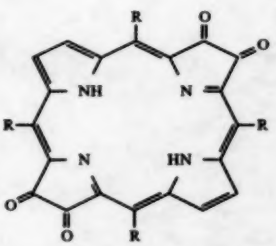


I(a)

wherein M is a metal atom, and

R is phenyl, alkyl substituted phenyl or halogen substituted phenyl.

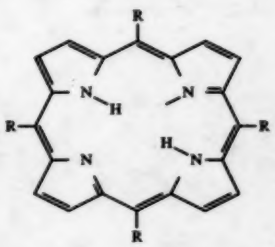
6. A process for the preparation of a tetraketone of the structure:



I

wherein R is selected from phenyl, alkyl substituted phenyl, or halogen substituted phenyl, which process comprises:

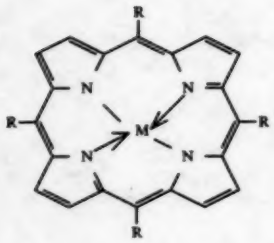
(a) treating the chemical of the structure:



II

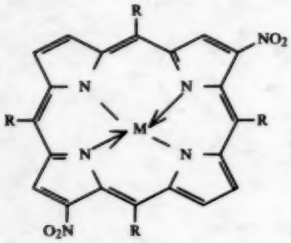
with an oxidizing agent to remove any dihydrochlorin impurity and produce chemical II in at least 95% purity:

(b) conducting the compound of step (a) with a metal salt to produce a porphyrin incorporating M;



IIa

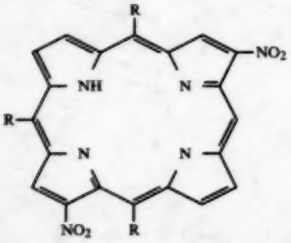
(c) contacting the purified chemical II(a) with N_2O_4 to produce the dinitro-III(a) of the structure:



III(a)

plus other isomers

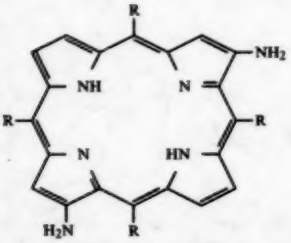
(d) contacting the dinitro compound of step (c) with concentrated sulfuric acid to produce the dinitro demetallated compound III:



III

plus other isomers

(e) reducing the dinitro-III of step (d) with a reducing agent to produce the diamino-IV of the structure:



IV

plus other isomers; and

(f) contacting the diamino-compound of step (e) with an oxidizing agent to produce the tetraketone of structure I.

4,908,443

7-BETA-SUBSTITUTED 3-LOWER ALKANOYLACETOXY-METHYL-7-ALPHA-METHOXY-3-CEPHEM-4-CARBOXYLIC ACID

Masami Abe, and Hideo Eiki, both of Ibaraki, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

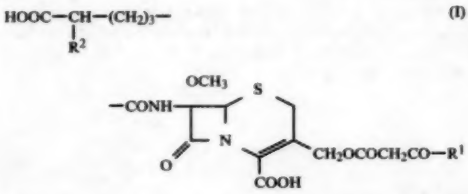
Continuation of Ser. No. 294,922, Jan. 5, 1989, abandoned, which is a continuation of Ser. No. 173,374, Mar. 25, 1988, abandoned. This application May 23, 1989, Ser. No. 356,607

Claims priority, application Japan, Mar. 31, 1987, 62-79973

Int. Cl.[4] C07D *501/57;* **A61K** *31/545*

U.S. Cl. 540—221 **1 Claim**

1. 7β-substituted-3-lower alkanoylacetoxymethyl-7α-methoxy-3-cephem-4-carboxylic acid represented by formula (I):



(I)

wherein R^1 represents a lower alkyl group and R^2 represents an amino group which may be protected by an aromatic acyl group or an arylcarbamoyl group or a salt thereof selected from the group consisting of alkali metal salts, alkaline earth metal salts and organic amine salts.

4,908,444

METHOD OF PRODUCING CEPHEM COMPOUNDS

Kenzo Naito, Soraku, and Yukio Ishibashi, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 14, 1987, Ser. No. 3,286

Claims priority, application Japan, Jan. 23, 1986, 61-13186; Dec. 24, 1986, 61-310553

Int. Cl.[4] C07D *501/04;* **A61K** *31/545*

U.S. Cl. 540—230 **8 Claims**

1. A method of producing a 3-alkanoyloxymethyl-3-cephem-4-carboxylic acid which comprises reacting a 3-hydroxymethyl-3-cephem-4-carboxylic acid with a compound of the formula:

wherein R^3 is an alkyl group containing 1 to 8 carbon atoms in an aqueous medium in the presence of a tri-C_{1-6}-alkylamino or cyclic tertiary amine and a 4-(tertiary amino)pyridine.

4,908,445

SESQUITERPENE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME, FROM PACHASTRELLA SPONGES

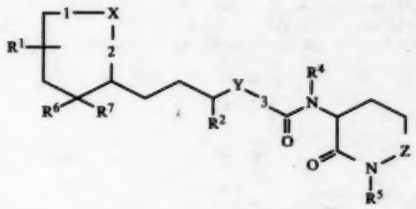
Kenneth L. Rinehart, Urbana, Ill., and Ashok D. Patil, King of Prussia, Pa., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Filed Jan. 9, 1989, Ser. No. 295,145

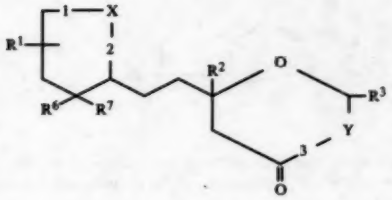
Int. Cl.[4] C07D *211/54, 309/38, 315/00*

U.S. Cl. 540—527 **26 Claims**

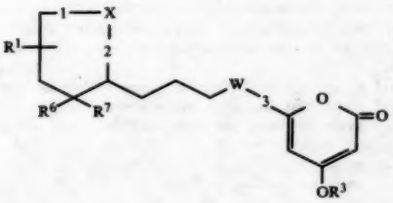
1. A compound of the formulae:



I



II



wherein

X = —1—CH_2—C(=CH_2)—2— or —1—CH=C(CH_3)—2—

Y = —CH_2—3— or =CH—3—

Z = —CH_2— or —CH_2—CH_2—

W = —CH(R^1)—3— or =C(R^1)—3—

and

R^1, R^2, R^3, R^4, R^5, R^6, R^7=H or lower alkyl.

4,908,446

INHIBITORS OF NONENZYMATIC CROSS-LINKING

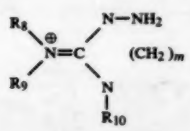
Peter C. Ulrich, New York, and Anthony Cerami, Shelter Island, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Nov. 13, 1987, Ser. No. 119,958

Int. Cl.[4] C07D *239/02, 403/30*

U.S. Cl. 540—553 **4 Claims**

1. The compounds of the formula



(II)

wherein R_8, R_9 and R_{10} are hydrogen or a lower alkyl group, and m is an integer of 2–4, and their pharmaceutically acceptable acid addition salts.

4,908,447

2-,6-DIPHENYLPYRIDINE COMPOUNDS USEFUL AS DYE PRECURSORS

Udo Mayer, Frankenthal, and Friedrich-Wilhelm Raulfs, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 97,167, Sep. 16, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,267

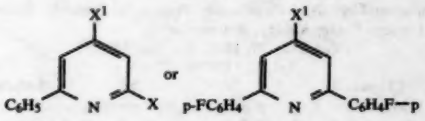
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1986, 3632009

Int. Cl.[4] C07D *401/02, 213/38*

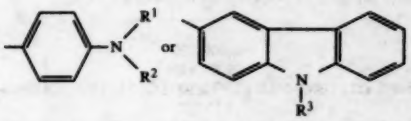
U.S. Cl. 544—124 **9 Claims**

1. A pyridine compound of the formula:

III



wherein radial X is phenyl which is monosubstituted or disubstituted by halogen, cyano, C_1–C_5-alkyl, C_1–C_5-alkoxy or C_1–C_5-alkoxycarbonyl and X^1 is a radical of the formula:



wherein R^1 and R^2 independently of one another are each straight-chain or branched C_1–C_8-alkyl, cyano-C_2–C_5-alkyl, halo-C_1–C_5-alkyl, phenyl or phenalkyl having a total of 7 to 14 carbon atoms, or

is a radical selected from the group consisting of N-piperidinyl, N-morpholinyl, N-piperazinyl, pyrrolidinyl and N'-C_1–C_4-alkylpiperazinyl, and R^3 is straight-chain or branched C_1–C_4-alkyl.

4,908,448

4-QUINAZOLONE COMPOUNDS

Reinhard Aldag, Ludwigshafen; Peter Neumann, Wiesloch; Andreas Boettcher, Leimen; Thomas Bluemel, Erpolzheim, and Friedrich Seitz, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

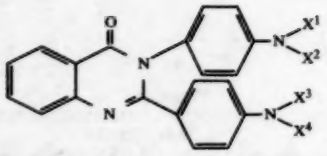
Division of Ser. No. 196,078, May 17, 1988. This application Aug. 4, 1989, Ser. No. 389,888

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717034

Int. Cl.[4] C07D *239/91*

U.S. Cl. 544—289 **3 Claims**

1. A 4-quinazolone compound of the formula



where X^1, X^2, X^3 and X^4 are identical to or different from each other and are each hydrocarbyl of 1 to 12 carbon atoms which may be substituted by OH, CN, halogen, phenyl, -O-CO-C_1- to -C_6-alkyl, -CO-O-C_1- to -C_6-alkyl or oxaalkyl of 3 to 12 carbon atoms and 1 to 5 oxygen atoms.

4,908,449

PROCESS FOR PREPARING N-METHYL DERIVATIVES OF LYSERGOL AND 10α-METHOXYLUMILYSERGOL

Christian Gervais, Villeurbanne, France, assignor to Rhone-Poulenc Sante, Antony, France

Filed Mar. 27, 1989, Ser. No. 329,387

Int. Cl.[4] C07D 457/02

U.S. Cl. 546—67 **3 Claims**

1. A process for preparing 1-methyllysergol, which comprises adding a base, which is an alkali metal hydride or alcoholate, to a solution of lysergol in a polar aprotic solvent in such a way that the molecular ratio between the base and the lysergol remains less than 0.5:1 throughout the reaction, and then adding a methylating agent which is methyl iodide, methyl sulphate or trimethylsulphonium iodide.

4,908,450

CERTAIN HEXAHYDRO-6-ARYLPYRROLO[2,1-A]ISOQUINOLINES

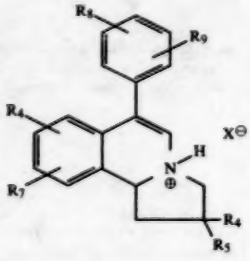
Bruce E. Maryanoff; Cynthia A. Maryanoff, both of Solebury Township, Bucks County; David F. McComsey, Warminster, and Kirk L. Sorgi, Norristown, all of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Division of Ser. No. 156,063, Feb. 16, 1988, Pat. No. 4,837,328. This application Jan. 31, 1989, Ser. No. 304,304

Int. Cl.[4] C07D 471/08, 491/08, 491/056

U.S. Cl. 546—94 **2 Claims**

1. An enammonium salt of the following formula (X):



(X)

wherein

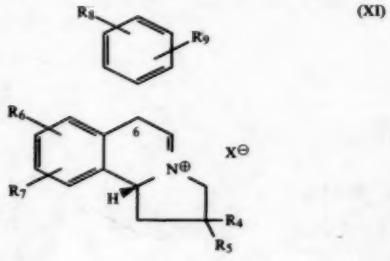
R_4 and R_5 are the same and both are hydrogen, or different and each is selected from the group of hydrogen or lower alkyl;

R_6 and R_7 are the same or different and each is selected from the group hydrogen, lower alkyl, lower alkoxy, hydroxy, or halogen, or else are taken together as methylenedioxy; and

R_8 and R_9 are selected from the group hydrogen, lower alkyl, perfluoro(lower)alkyl, lower alkoxy, carb(lower)alkoxy, lower alkylthio, lower alkylsulfonyl, nitro, or halogen; and

X is an anion.

2. An iminium salt of the following formula (XI)



(XI)

wherein

R_4 and R_5 are the same and both are hydrogen, or different and each is selected from the group of hydrogen or lower alkyl;

R_6 and R_7 are the same or different and each is selected from the group hydrogen, lower alkyl, lower alkoxy, hydroxy, or halogen, or else are taken together as methylenedioxy; and

R_8 and R_9 are selected from the group hydrogen, lower alkyl, perfluoro(lower)alkyl, lower alkoxy, carb(lower)alkoxy, lower alkylthio, lower alkylsulfonyl, nitro, or halogen; and

X is an anion.

4,908,451

PROCESS FOR PREPARING α-SUBSTITUTED CARBONYL COMPOUND

Masato Tanaka, and Toshiyasu Sakakura, both of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

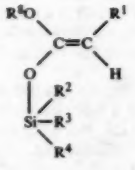
Division of Ser. No. 883,808, Jul. 7, 1986, Pat. No. 4,772,714. This application Mar. 23, 1988, Ser. No. 172,155

Claims priority, application Japan, Jul. 8, 1985, 60-149727; Jul. 8, 1985, 60-149728; Jul. 8, 1985, 60-149729

Int. Cl.[4] C07D 401/00, 409/00, 411/00, 211/72

U.S. Cl. 546—267 **6 Claims**

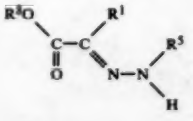
1. A process for the preparation of an α-hydrazono ester represented by the formula (7), which comprises reacting a ketene silyl acetal represented by the formula (6) with a diazonium salt represented by the formula (2):



(6)

$$[R^5-N{=}N-X] \quad (2)$$

$$R_5-N{=}N^+-X^- \quad (2)$$



(7)

wherein R^1 is a member selected from the group consisting of C_{1-8} alkyl, C_{7-8} aralkyl, C_{6-10} aryl, C_{2-8} alkenyl, C_{2-8} alkynyl, C_{3-5} heteroaryl and substituted derivatives thereof containing a substituent selected from the group consisting of halogen, alkoxy, alkoxycarbonyl, dialkylamino, β-indolyl, dialkoxymethyl, thioalkoxy, nitro and cyano; each of R^2, R^3, R^4 and R^8 is a member independently selected from the group consisting of the above alkyl, aryl and aralkyl; R^5 is a member selected from the group consisting of phenyl, chlorophenyl, bromophenyl, nitrophenyl, tolyl, anisyl, formylphenyl, ethoxycarbonylphenyl, dimethoxymethylphenyl, naphthyl, pyridyl, furyl, thienyl and 4,4'-biphenylenyl; and X is a member selected from the group consisting of Cl, HSO_4, NO_3, ClO_4, BF_4, $B(C_6H_5)_4$, PF_6, CH_3CO_2, ½ $ZnCl_4$, ½ $SnCl_6$, ½ $HgCl_4$, ½ $CdCl_4$, ½ $Fe(CN)_6$ and $FeCl_4$.

4,908,452

PROCESS FOR PREPARING NITRILES

David A. Claremon, Audubon, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 21, 1987, Ser. No. 135,866
Int. Cl.[4] C07D 303/46, 213/82; C07C 120/10
U.S. Cl. 546—286 **12 Claims**

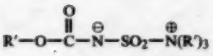
1. A process for preparing by selective dehydration, a nitrite compound from the corresponding carboxamide compound, said nitrile compound represented by the formula

(I)

which comprises intimately mixing and causing to react a carboxamide compound represented by the formula

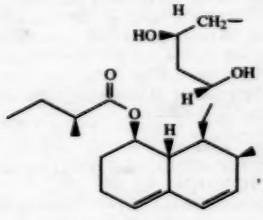
(II)

with a molar excess of a (carboxysulfamoyl)ammonium hydroxide compound represented by the formula



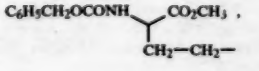
(III)

at temperatures in the range of from −10° C. to 80° C. under anhydrous conditions in an inert solvent and in an inert atmosphere for time sufficient to effect dehydration to form the corresponding nitrile, wherein in the foregoing formulas, R is selected from the group consisting of

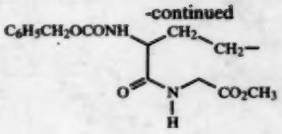


(a)

(b)

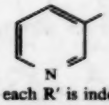


(c)



(d)

and



(e)

and each R′ is independently lower alkyl from 1 to 4 carbon atoms, benzyl or phenylethyl.

9. A process according to claim 1 in which R is

and R′ is methyl.

4,908,453

REAGENTS FOR THE PREPARATION OF 5'-BIOTINYLATED OLIGONUCLEOTIDES

Anthony J. Cocuzza, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

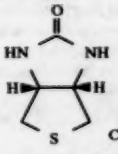
Filed Jan. 23, 1989, Ser. No. 300,504
Int. Cl.[4] C07F 9/65
U.S. Cl. 548—113 **20 Claims**

1. A chemical compound of the formula

Bt-(SG)-A-Q

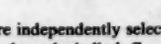
wherein

Bt is



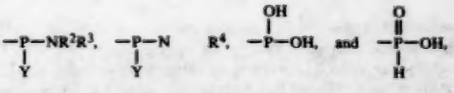
SG is an organic diradical spacer group that separates Bt from A at a distance sufficient to allow efficient complexation of Bt to avidin or streptavidin;

A is selected from the group consisting of —O—, —S—,



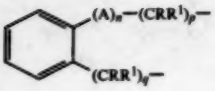
wherein R and R^1 are independently selected from the group consisting of H, C_{3-10} branched alkyl, C_{1-10} unbranched alkyl, C_{6-10} *aryl, C7–12 alkaryl, and C7–12 aralkyl;*

Q is selected from the group consisting of

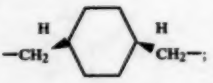


and salts thereof; wherein R^2 and R^3 are independently selected from the group consisting of C_{3-10} branched alkyl

and C_{1-12} unbranched alkyl; R^4 is selected from the group consisting of $-(CRR^1)_m(A)_n(CRR^1)m-$,



, and



R, R^1 and A are as defined above; m=1-6; n=0-1; p=1-10; q=0-10, provided that $2m+n \leqq 12$, and further provided that $2 \leqq n+p+q \leqq 13$; and Y is any phosphate-protecting group.

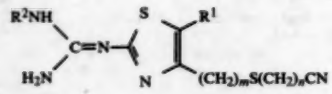
4,908,454

PROCESS OF PRODUCING GUANIDINOTHIAZOLE DERIVATIVES

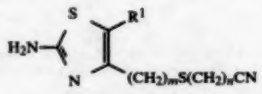
Yoshio Ishii, Saitama, and Isao Yanagisawa, Tokyo, both of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Chuo-Tokyo, Japan

Continuation of Ser. No. 105,454, Oct. 2, 1987, abandoned, which is a division of Ser. No. 766,634, Aug. 16, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 300,760
Claims priority, application Japan, Aug. 30, 1984, 59-182129
Int. Cl.[4] C07D *277/48*
U.S. Cl. 548—193 **4 Claims**

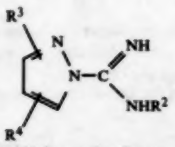
1. A process of producing a guanidinothiazol compound of the formula



wherein R^1 and R^2, which may be the same or different, each represents a hydrogen or an alkyl group having 1 to 3 carbon atoms; m represents 1 or 2; and n represents 2, 3 or 4, or an acid addition salt thereof, which comprises reacting in the presence of a Lewis acid catalyst, an aminothiazol compound represented by the formula:



wherein R^1, m and n have the same values as defined above, or an acid addition salt and an amidinopyrazole compound represented by the formula:



wherein R^3 and R^4, which may be the same or different, each represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms and R^2 has the same value as defined above, said reaction being effected in a high-boiling solvent at a temperature of at least 100° C. and wherein said Lewis acid catalyst is selected from the group consisting of zinc oxide, zinc chloride, copper (I) chloride and aluminum chloride, and thereafter recovering said guanidinothiazole.

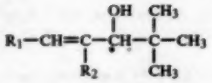
4,908,455

METHOD FOR PRODUCING AN OPTICALLY ACTIVE AZOLYL-α β-UNSATURATED ALCOHOL

Yukio Yoneyoshi, Ohtsu; Gohfu Suzukamo, Ibaraki, both of Japan; Yoji Sakito, Montreal, Canada, and Toshio Nishioka, Ashiya, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

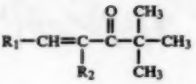
Continuation-in-part of Ser. No. 89,051, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 682,002, Nov. 21, 1984, abandoned. This application Feb. 19, 1988, Ser. No. 161,242
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[4] C07D *249/08*
U.S. Cl. 548—268.4 **9 Claims**

1. A method for producing optically active alcohol derivatives represented by the formula (III)



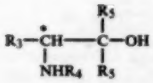
(III)

wherein R_1 represents a C_3-C_8 cycloalkyl, or a phenyl which may be substituted with a halogen, or a C_1-C_4 haloalkyl, R_2 represents 1,2,4-triazol-1-yl and the mark * means an asymmetric carbon, comprising asymmetrically reducing a ketone compound represented by the formula (I),



(I)

wherein R_1 and R_2 have the same meanings as above, with boron hydride reducing agent modified with an optically active amino alcohol represented by the formula (II),



(II)

wherein said modified boron hydride reducing agent is obtained by reacting a metal borohydride with a salt of the optically active amino alcohol with acid or by reacting a borane with the optically active amino alcohol, each in a molar ratio of a range from 0.3:1 to 1.2:1 and wherein R_3 represents C_1-C_8 alkyl or C_7-C_{11} aralkyl, R_4 represents a hydrogen, R_5 represents a hydrogen or C_7-C_{16} aralkyl or a phenyl which may be substituted with C_1-C_6 alkoxy, and the mark * has the same meaning as above, in the presence or absence of an acid.

4,908,456

PROCESS FOR PREPARING METHYLOLATED HYDANTOINS

Thomas E. Farina, Montoursville, and Lloyd C. Franklin, Montgomery, both of Pa., assignors to Takatori Corporation and Takatori Hitech Co., Ltd., both of Nara, Japan

Filed Apr. 5, 1989, Ser. No. 333,588
Int. Cl.[4] C07D *233/72, 233/78*
U.S. Cl. 548—312 **20 Claims**

1. A method for the production of a methylolated hydantoin which comprises reacting a hydantoin, a source of formaldehyde, and an alkaline catalyst in the effective absence of water at conditions of temperature and pressure sufficient to produce said methylolated hydantoin.

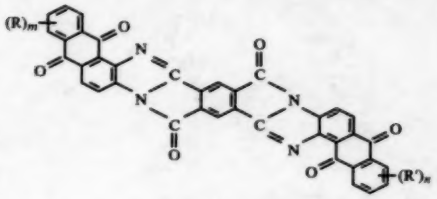
4,908,457

1,2,4,5-BENZOYLENEBIS(ANTHRAQUINONE[1,2-D]IMIDAZOLE) COMPOUNDS

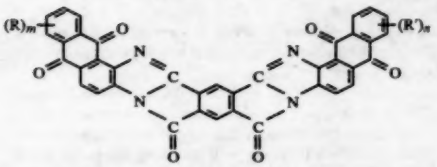
Satoshi Katsyama, Tenri; Yoshihide Shimoda, Nara; Hiroshi Sugimura, Habikino; Eiji Imada, and Shuhei Tsuchimoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 7, 1988, Ser. No. 280,972
Claims priority, application Japan, Dec. 8, 1987, 62-310466
Int. Cl.[4] C07D *487/22*
U.S. Cl. 548—324 34 Claims

1. A 1,2,4,5-Benzoylenebis(anthraquinone[1,2-d]imidazole) compound represented by the following formula



(1)



(2)

wherein R and R′ each are hydrogen atom, a halogen atom, hydroxyl group, a lower alkyl group, a lower alkoxy group or an aryl group which may be substituted and m and n each are an integer of 1 or 2.

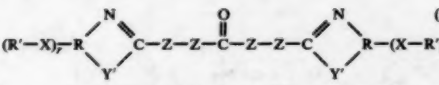
4,908,458

KETOHETEROCYCLIC DERIVATIVES

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1988, Ser. No. 284,873
Int. Cl.[4] C07D *403/06, 413/06, 417/06*
U.S. Cl. 548—328 12 Claims

1. The 1,5-di(benzoheterocyclic)-3-oxopentane compound of the formula



(IV)

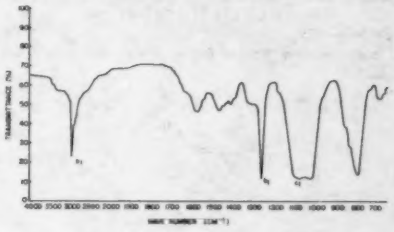
wherein R is aromatic of up to 30 carbon atoms and from 1 to 2 aromatic rings, inclusive, R′ is R or aliphatic of up to 10 carbon atoms inclusive, r independently is 0 or 1, Y′ is imino, alkylimino, oxy or thio, X is a direct valence bond, alkylene of up to 8 carbon atoms inclusive, oxy, thio, sulfonyl, carbonyl, dioxyphenylene, 2,2-dioxyphenyl)propane, di(oxyphenyl) sulfone or dioxydiphenylene and Z independently is $>C(Z')_2$ in which Z′ independently is hydrogen, lower alkyl, lower halogen or phenyl, or Z is such that adjacent Z moieties form a ring system Z″ of from 5 to 7 ring atoms, up to two of which are heteroatoms selected from nitrogen, oxygen or sulfur with the remainder of the ring atoms being carbon atoms, there being up to 15 carbon atoms in each Z″, two of which form a bridge between the carbon atoms connected by the adjacent Z moieties, with the proviso that N and Y′ are substituted on adjacent carbon atoms of R.

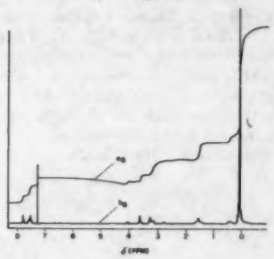
4,908,459

GLYCIDYL SULFONAMIDE COMPOUND

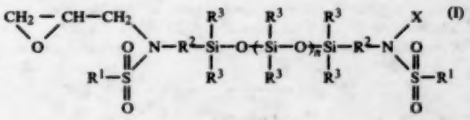
Yoshikuni Deguchi; Hiroshi Iwarkiri; Kazunari Iwamoto, and Kazuya Yonezawa, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1988, Ser. No. 291,927
Claims priority, application Japan, Apr. 28, 1988, 63-106607; Apr. 28, 1988, 63-106608
Int. Cl.[4] C07D *303/02*
U.S. Cl. 549—215 5 Claims





1. A glycidyl sulfonamide compound represented by the formula (I):



(I)

wherein each R^1 is a monovalent hydrocarbon group having 1 to 20 carbon atoms, each R^2 is a bivalent hydrocarbon group having 1 to 6 carbon atoms, each R^3 is a monovalent hydrocarbon group having 1 to 6 carbon atoms, n is 0 or an integer of 1 to 70 and X is hydrogen atom or glycidyl group.

4,908,460

PROCESS FOR PURIFICATION OF 2,2,3,3-TETRAFLUOROOXETANE

Yohnosuke Ohsaka, and Shoji Takaki, both of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Jan. 23, 1989, Ser. No. 299,352
Claims priority, application Japan, Jan. 23, 1988, 63-12998
Int. Cl.[4] C07D *305/04*
U.S. Cl. 549—511 5 Claims

1. A process for purifying 2,2,3,3-tetrafluorooxetane which contains at least one impurity compound selected from the group consisting of hydrogen fluoride and trifluoropropionyl-fluoride, which process comprises contacting 2,2,3,3-tetrafluorooxetane with at least one adsorbent selected from the

group consisting of silica gel and alumina and causing said impurity to be adsorbed on said adsorbent, thereby removing said impurity from the 2,2,3,3-tetrafluorooxetane.

4,908,461

PROCESS FOR DECHLORINATING 4,5-DICHLOROFLUORODIOXOLANES TO OBTAIN FLUORODIOXOLES

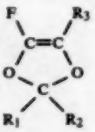
Ming-Hong Hung, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 135,396, Dec. 31, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 274,955

Int. Cl.[4] C07D 317/42

U.S. Cl. 549—455 **3 Claims**

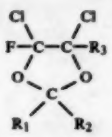
1. Dechlorination process for preparing the dioxole of the formula



wherein R_1 and R_2 are each independently selected from the class consisting of fluorine, chloroalkyl, chlorofluoroalkyl and fluoroalkyl of 1–3 carbon atoms, and R_3 is F, Cl or perfluoroalkyl of 1–3 carbon atoms, which process comprises:

A. adding $LiAlH_4$ and $TiCl_x$ wherein x is 3 or 4 to tetrahydrofuran at a molar ratio of $LiAlH_4$ to $TiCl_x$ of 2:1 to 8:1, and mixing the components at 0° C. to the reflux temperature of the mixture for 15–120 minutes;

B. mixing the dioxolane of the formula



wherein R_1, R_2 and R_3 are as defined above into the mixture prepared in Step A until the molar ratio of the dioxolane to $TiCl_x$ is 1:1 to 4:1, at a temperature of 20°–35° C.; and

C. isolating from Step B the dioxole of the aforesaid formula formed.

4,908,462

COBALT RECOVERY METHOD

Nobuo Ohtsuka, Saita, Japan, assignor to Starloy Industrial Co., Ltd., Osaka, Japan

Filed May 1, 1989, Ser. No. 346,332

Claims priority, application Japan, Jan. 22, 1985, 60-010673

Int. Cl.[4] C07F 15/06

U.S. Cl. 556—147 **8 Claims**

1. A cobalt recovery method for the recovery of cobalt oxalate containing no other salts from solutions containing cobalt salts, comprising: (a) extraction with an extraction agent, mainly composed of 2-ethyl hexylphosphonate mono-2-ethyl hexylester or di-2-ethyl hexylphosphate and octyl alcohol, or isodecanol, in order to extract and separate cobalt from the solution containing the cobalt salts, so that the cobalt ion may be selectively shifted into the extraction agent and, after the separation of the cobalt from other salts including nickel ions, sodium salt, calcium salt, in the solution, (b) stripping is performed by bringing the extraction agent containing cobalt into contact with an aqueous solution of oxalic acid so that cobalt is subjected to stripping into the oxalic acid solution and (c) recovering the desired product.

4,908,463

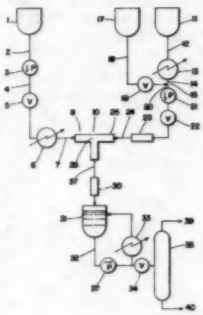
ALUMINOXANE PROCESS

Scott A. Bottelberghe, Port Allen, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 5, 1988, Ser. No. 279,496

Int. Cl.[4] C07F 5/06

U.S. Cl. 556—179 **19 Claims**



1. A process for making a hydrocarbyl aluminoxane, said process comprising:

(A) forming a solution of about 1–30 weight percent of a hydrocarbyl aluminum compound in a dry inert hydrocarbon solvlent,

(B) conducting an inert hydrocarbon solvent containing 0.25–5.0 weight percent of a separate water phase through a static mixer comprising a plurality of deflection elements which provide a tortuous path through said static mixer thereby dispersing said water in the hydrocarbon solvent to form a water dispersion,

(C) conducting both (1) said hydrocarbyl aluminum compound solution and (2) said water dispersion at a velocity of about 0.5–20 ft/sec to a reaction zone whereby said hydrocarbyl aluminum compound solution and said water dispersion enter said reaction zone and co-mingle, one with the other, and react to form a hydrocarbyl aluminoxane solution further characterized in that the ratio of aluminum atoms to moles of water entering said reaction zone is in the range of 1:1 to 2:1, and

(D) promptly removing said hydrocarbyl aluminumoxane solution from said reaction zone through an outlet conduit at a rate such that the total residence time in said outlet conduit is from 1 milisecond to 1 minute.

4,908,464

PROCESS FOR THE PRODUCTION OF 1,3,2-OXAZAPHOSPHORINANES

Wojciech J. Stec, Lódz; Czeslaw Radzikowski, Wroclaw; Wieslaw Szelejewski, Warsaw; Ryszard Kinas; Konrad Misiura, both of Lódz; Grzegorz Grynkiewicz; Jacek Grodner, both of Warsaw; Halina Kusnierczyk, Wroclaw; Andrzej Kutner, Warsaw, and Slawomira Pilichowska, Lódz, all of Poland, assignors to Instytut Przemyslu Farmaceutycznego; Centrum Baden Molekularnych i Makromolekularnych -PAN and Instytut Immunologii i Terapii Doswiadczalnej -PAN, all of, Poland

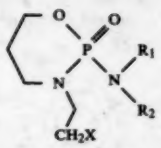
Filed Jun. 9, 1988, Ser. No. 204,582

Claims priority, application Poland, Jun. 13, 1987, 266240

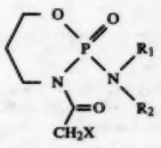
Int. Cl.[4] C07F 9/24

U.S. Cl. 558—81 **3 Claims**

1. A process for the preparation of the derivatives of 1,3,2-oxazaphosphorinane of general formula I,



wherein R_1 and R_2 represent hydrogen atom or 2-halogenoalkyl group and R_1 and R_2 are not at the same time hydrogen atoms, and X represents halogen atom, which comprises reduction of the compound of general formula 2,



wherin substituents have the above given meaning, with sodium borohydride, used in a stoichiometric amount in the presence of boron trifluoride etherate in the medium of neutral ether type organic solvent, and isolation and purification of the product by a known method.

4,908,465

SUBSTITUTED PROPANE-PHOSPHONOUS ACID COMPOUNDS

John G. Dingwall, Pantaleon; Josef Ehrenfreund, Allschwil, both of Switzerland; Roger G. Hall, Chorlton-cum Hardy, and James Jack, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 940,836, Dec. 12, 1986, Pat. No. 4,772,738, which is a division of Ser. No. 787,300, Oct. 15, 1985, Pat. No. 4,656,298. This application Jun. 7, 1988, Ser. No. 203,851

Claims priority, application United Kingdom, Dec. 10, 1984, 8425872

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] C07F *9/48*

U.S. Cl. 558—175 **5 Claims**

1. Ethyl 2-(4-chlorophenyl)-3-nitropropyl(diethoxymethyl)-phosphinate.

2. Ethyl 2-phenyl-3-nitropropyl(diethoxymethyl)phosphinate.

3. Ethyl 2-(4-fluorophenyl)-3-nitropropyl(diethoxymethyl)-phosphinate.

4. Ethyl 2-(4-methylphenyl)-3-nitropropyl(diethoxymethyl)-phosphinate.

5. Ethyl 2-(4-methoxyphenyl)-3-nitropropyl(diethoxymethyl)phosphinate.

4,908,466

PROCESS AND REACTION VESSEL FOR PRODUCTION OF ALKYL NITRITE

James R. Nelson, South Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 29, 1987, Ser. No. 102,367

Int. Cl.[4] C07C *76/04*

U.S. Cl. 558—488 **8 Claims**

1. A process for producing alkyl nitrite comprising:

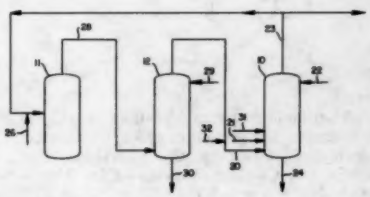
(a) contacting nitric oxide, a lower alcohol and oxygen in a reaction zone under conditions wherein at least a portion of said nitric oxide, lower alcohol and oxygen react to form alkyl nitrite, said reaction zone comprising at least two sections, a lower reactor packed bed section and an upper rectification section containing spaced distillation trays;

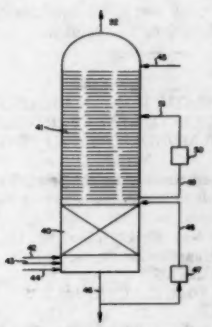
(b) supplying a liquid scrubbing agent to an upper portion of said rectification section;

(c) withdrawing from said rectification section a gaseous reaction product stream comprising alkyl nitrite;

(d) withdrawing from said reactor section a liquid stream comprising scrubbing agent and water;

wherein said reactor section provides intimate vapor-liquid contact and cooling sufficient to enhance the conversion of nitric oxide to alkyl nitrite and said rectification section provides sufficient vapor residence time to enhance conversion of oxygen and sufficient rectification capabilities to reduce the amounts of water and nitric acid in the gaseous reaction product stream and the amount of alkyl nitrite in the liquid stream.





8. A process for the production of methyl nitrite comprising contacting nitric oxide, methanol and oxygen in a reaction zone, said reaction zone comprising at least two sections, a lower packed bed section and an upper rectification section containing spaced distillation trays wherein:

(1) oxygen conversion is 99 percent or higher, and

(2) nitric oxide efficiency to alkyl nitrite is 99 percent or higher.

4,908,467

CERTAIN FLUOROALKYLPHENYLSULFONAMIDES

Willy Meyer, Riehen, and Konrad Oertle, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

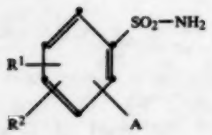
Division of Ser. No. 30,529, Mar. 27, 1987, Pat. No. 4,759,793, which is a division of Ser. No. 810,010, Dec. 17, 1985, Pat. No. 4,671,819, which is a continuation of Ser. No. 717,639, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 590,928, Mar. 19, 1984, abandoned. This application Apr. 8, 1988, Ser. No. 179,339

Claims priority, application Switzerland, Mar. 28, 1983, 1677/83; Aug. 11, 1983, 4393/83

Int. Cl.[4] C07C *143/58, 143/78, 143/80*

U.S. Cl. 560—12 2 Claims

1. A phenylsulfonamide of the formula II



(II)

wherein

A is 3,3,3-trifluoropropyl or 3,3-difluorobutyl,

R^1 is hydrogen, halogen, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, —CO—R^6, —NR^7R^8, —CO—NR^9R^{10} or —SO_2—$NR^{11}R^{12}$,

R^2 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulfinyl or C_1–C_4-alkylsulfonyl,

R^6 is C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_2–C_6-alkoxyalkoxy, hydrogen, C_1–C_4-alkyl or C_1–C_4-haloalkyl and

R^7, R^8, R^9, R^{10}, R^{11} and R^{12} independently of one another are each hydrogen or C_1–C_4-alkyl.

4,908,468

AMPHIPHATIC POLYMERIZABLE VINYL MONOMERS, VINYL RESIN PARTICLES DERIVED FROM SAID MONOMERS AND PREPARATION THEREOF

Hisaichi Muramoto, Osaka; Koichi Saito, Kyoto, and Keizou Ishii, Hyogo, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

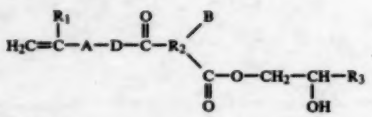
Filed Nov. 30, 1987, Ser. No. 126,965

Claims priority, application Japan, Nov. 28, 1986, 61-285708; Nov. 28, 1986, 61-285709

Int. Cl.[4] C07C *143/525*

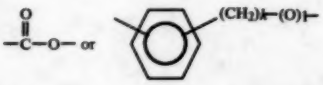
U.S. Cl. 560—14 4 Claims

1. An amphiphatic, polymerizable vinyl monomer represented by the formula:

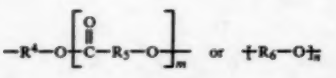


(I)

wherein R_1 is hydrogen or a methyl group; R_2 is a substituted or unsubstituted aliphatic hydrocarbon having 5 to 10 carbon atoms, an alicyclic hydrocarbon having 6 to 7 carbon atoms or an aromatic hydrocarbon having 6 to 13 carbon atoms; R_3 is a hydrocarbon residue selected from aliphatic hydrocarbons having 1 to 30 carbon atoms, alicyclic hydrocarbons having to 10 carbon atoms, aromatic hydrocarbons having 6 to 13 carbon atoms or their substituted derivatives or a hydrocarbon residue selected from aliphatic hydrocarbons having 1 to 30 carbon atoms, alicyclic hydrocarbons having 6 to 10 carbon atoms or their substituted derivatives, containing in its main chain at least one group selected from a vinyl group, an allyl group, an ether group, an ester group and a carbonyl group; A represents



group, in which k and l each is 0 or 1; D is a repeating unit of



R_4 is ethylene or propylene; R_5 is a substituted or unsubstituted alkylene having 2 to 7 carbon atoms; R_6 is a substituted or unsubstituted alkylene having 2 to 5 carbon atoms; m and n each represents the average number of the respective repeating units wherein m is an integer of 1 to 10 and n is an integer of 2 to 50; and B is —COOH or —SO_3H.

4,908,469

2-HYDROXY-PROPANOIC ACID ACYCLIC ALKYL ESTERS FOR BENZOTHIAZEPINES

Daniel E. Martin, Lee's Summit, Mo., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed May 18, 1988, Ser. No. 195,709

Int. Cl.[4] C07C *149/40*

U.S. Cl. 560—17 14 Claims

1. A process comprising contacting a 2-Aminothiophenol with an optically active 3-(4-alkyloxyphenyl)glycidic acid acyclic alkyl ester by step(s) under conditions such that an optically active 2-hydroxy-3-(4-alkyloxyphenyl)-3-(2-Aminophenylthio)propionic acid acyclic alkyl ester is prepared.

4,908,470

PROCESS FOR THE METHYL-4-(DIMETHYLAMINO)-3,5-DIMETHOXYBENZOATE

Alfredo Guerrato, Trissino, Italy; Martin Karpf, Reinach, Switzerland; Hanny K. Berger, Aesch, Switzerland; Ivan Kompis, Oberwil, Switzerland, and Markus Schlageter, Bottmingen, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Nov. 30, 1988, Ser. No. 278,058

Claims priority, application Switzerland, Dec. 3, 1987, 4720/87

Int. Cl.[4] C07C *101/48*

U.S. Cl. 560—46 2 Claims

1. A process for the preparation of methyl 4-(dimethylamino)-3,5-dimethoxybenzoate which comprises reacting 4-amino-3,5-dibromobenzoic acid with an alkali methylate in the presence of Cu_2O and dimethylformamide or dimethylacetamide, and methylating the resulting 4-amino-3,5-dimethoxybenzoic acid with dimethyl sulfate in the presence of a base selected from the group consisting of lower aliphatic ketone and cycloaliphatic ketone, while heating, to yield methyl 4-(dimethylamino)-3,5-dimethoxybenzoate.

4,908,471

METHOD FOR THE PRODUCTION OF BENZENE CARBOXYLIC ACIDS AND BENZENE DICARBOXYLIC ACID ESTERS

Hans Leuck, and Hans-Jörg Westermann, both of Troisdorf, Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Cologne, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 156,257

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704720

Int. Cl.[4] C07C *67/39, 51/265*

U.S. Cl. 560—77 14 Claims

1. A method for preparing benzene carboxylic acids and benzene dicarboxylic acid esters and their mixtures comprising: introducing into an oxidator, xylene and/or toluylic acid ester and a heavy metal-containing oxidation catalyst to form a reaction phase; and oxidizing the xylene and/or toluylic acid ester with oxygen or an oxygen-containing gas in the presence of the heavy metal-containing oxidation catalyst at a temperature of 100° to 200° C. with the use of elevated pressure of 0.2 to 1.5 MPa, wherein said oxidizing is carried out by withdrawing at least a portion of the reaction phase and recycling the reaction phase into the reactor in the form of a highly dispersed reaction phase by atomizing the reaction phase with the addition of oxygen or an oxygen-containing gas in at least one single orifice mixing nozzle to bring about the oxidation.

4,908,472

PREPARATION PROCESS OF CINNAMATE ESTER

Usaji Takaki; Shinobu Aoki; Yoshihiro Yamamoto, and Isao Hara, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,207

Claims priority, application Japan, Dec. 28, 1987, 62-330164

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—104 16 Claims

1. A process for preparing a cinnamate ester comprising

(1) forming a reaction mixture of a styrene compound, an alcohol and a catalyst in a reactor;

(2) blowing a feed gas mixture of carbon monoxide, oxygen and an inert gas into the reaction mixture through at least one feed port;

(3) collecting a discharge gas flowing from the reactor and passing the gas through a condenser to form a condensate;

(4) recirculating the condensate into the reactor;

(5) blowing into the reaction mixture through at least one feed port other than the feed port(s) used in step (2), a gas selected from the group consisting of the discharge gas and an inert gas; and

(6) isolating the cinnamate ester from the mixture.

4,908,473

PROCESS FOR SELECTIVELY HYDROESTERIFYING DIOLEFIN

Isoo Shimizu; Yasuo Matsumura, both of Yokohama, and Yutaka Arai, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

PCT No. PCT/JP88/00264, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/07034, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 12, 1988, Ser. No. 275,081

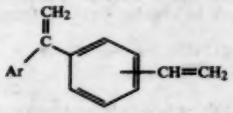
Claims priority, application Japan, Mar. 12, 1987, 62-57099

Int. Cl.[4] C07C *69/76*

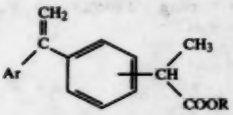
U.S. Cl. 560—104 8 Claims

1. A process for selective hydroesterification which is characterized in the step of reacting a (1-arylethenyl)vinylbenzene represented by the following formula (I) with carbon monoxide and water or a lower alcohol in the presence of a noble metal complex carbonylation catalyst at a temperature of 40° to 200° C. and a carbon monoxide pressure of 20 to 700 kg/cm^2, thereby producing α-((1-arylethenyl)phenyl)propionic acid or its alkyl ester represented by the following formula (II),

Formula (I)



Formula (II)



(in which Ar is a substituted aryl group which may have a substituent group other than vinyl group and R is a hydrogen atom or a lower alkyl group).

4,908,474

PREPARATION OF ESTERS

John P. Sankey, Warrington, and Robert Johnson, Liverpool, both of England, assignors to Interox Chemicals Limited, London, England

Filed May 26, 1988, Ser. No. 199,959

Claims priority, application United Kingdom, Jun. 2, 1987, 8712909

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—109 32 Claims

1. In a process for the production of benzoyl oxybenzene sulphonate salts in which an alkali metal phenol sulphonate is mixed with benzoyl chloride and permitted to remain in contact until at least some benzoyl oxybenzene sulphonate has formed the improvement which comprises essentially employing at least an equimolar amount of benzoyl chloride in the presence of a restricted amount of water and base.

4,908,475

INTERMEDIATES FOR PREPARING 1,6-DICARBA-VASOPRESSIN COMPOUNDS

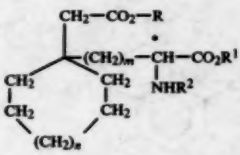
James F. Callahan, Philadelphia; William F. Huffman, Malvern; Kenneth A. Newlander, West Chester, and Nelson C. F. Yim, Ambler, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 43,658, Apr. 28, 1987, Pat. No. 4,760,052, which is a continuation-in-part of Ser. No. 819,336, Jan. 16, 1986, abandoned. This application May 9, 1988, Ser. No. 192,736

Int. Cl.[4] C07C *125/065*

U.S. Cl. 560—115 5 Claims

1. A chemical compound having the formula:



in which:

• is to indicate D isomer, L isomer or a D, L mixture;

m is an integer of from 2–4;

n is 0 or 1;

R and R^1 are, each, hydrogen or a carboxy protecting group; and

R^2 is hydrogen or an amino protecting group.

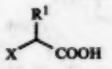
4,908,476

SYNTHESIS OF 2-(4-HYDROXYPHENOXY)ALKANOIC ACIDS

Varadaraj Elango, and Kenneth G. Davenport, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Sommerville, N.J.

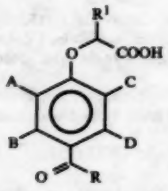
Filed Mar. 21, 1988, Ser. No. 170,728
Int. Cl.[4] C07C *69/00, 59/68*
U.S. Cl. 560—144 31 Claims

1. A method for synthesizing 2-(4-hydroxyphenoxy)alkanoic acids which comprises reacting a hydroxyaromatic ketone derivative (II) of the formula



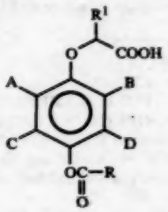
or a salt thereof; with a substituted acid of the formula under basic conditions to thereby form a 2-(acylphenoxy)alkanoic acid (III) of the formula

(III)



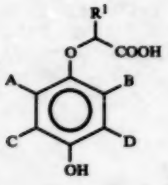
and then oxidizing the thusly formed 2-(acylphenoxy)alkanoic acid with a peracid or peroxide to obtain an 2-(ayloxyphenoxy)alkanoic acid (IV) of the formula

(IV)



and then hydrolyzing or transesterifying said 2-(acyloxyphenoxy)alkanoic acid with a compound of the formula R^2OH/H^+ to obtain a 2-(4-hydroxyphenoxy)alkanoic acid (V) of the formula

(V)



wherein R is C_1 to C_{18} alkyl or C_6 to C_{10} aryl; and wherein R^1 is H, phenyl or C_1 to C_{18} alkyl; and wherein R^2 is C_1 to C_{18} alkyl, or aryl; and wherein A, B, C and D are independently H, X, CN, C_1 to C_{18} alkyl, or C_6 to C_{10} aryl; and X is F, Cl, Br, I or a sulfonic ester.

4,908,477

REMOVAL OF ORGANIC IODINE COMPOUNDS FROM CARBONYLATION PRODUCTS OF METHANOL METHYL ACETATE AND DIMETHYL ETHER

Horst Hartmann, Boehl-Iggelheim; Waldheim Hochstein, Freinsheim; Gerd Kaibel, Lampertheim, and Franz-Josef Mueller, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 348,199, Feb. 12, 1982, abandoned. This application Mar. 9, 1987, Ser. No. 23,990
Int. Cl.[4] C07C *51/48, 45/80, 67/58, 53/08*
U.S. Cl. 560—248 5 Claims

1. A process for purifying a mixture of liquid carbonylation products formed in the carbonylation of methanol, methylacetate and/or dimethyl ether in the presence of iodides by removing methyl iodide from said products, which process comprises: passing a non-aromatic hydrocarbon of 4–14 carbon atoms in countercurrent direction through the liquid carbonylation mixture to extract methyl iodide from the mixture of carbonylation products in from 1 to 10 extraction stages and thus substantially lowering the amount of methyl iodide in such products.

4,908,478

SINGLE-VESSEL PROCESS FOR PREPARING 2-ACETAMINONAPHTHALENE-6-SULFONIC ACID OF HIGH PURITY

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 885,014, Jul. 14, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 271,376
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536036
Int. Cl.[4] C07C *143/60*
U.S. Cl. 562—55 3 Claims

2. In a single-vessel process for preparing 2-acetaminophthalene-6-sulfonic acid of high purity by sulfonating 2-hydroxynaphthalene with concentrated sulfuric acid, converting the 2-hydroxynaphthalenesulfonic acid formed thereby with ammonia in the presence of ammonium hydrogensulfite into 2-aminonaphthalene-6-sulfonic acid (Bucherer reaction and N-acetylating the said 2-aminonaphthalene-6-sulfonic acid to give 2 acetaminonaphthalene-6-sulfonic acid, the improvement which comprises:

after diluting the sulfonating melt with water, substantially removing any impurities still present in the resulting aqueous solution of 2-hydroxynaphthalene-6-sulfonic acid by extraction with toluene or xylene and clarification using active carbon.

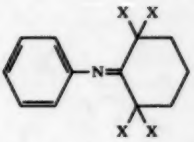
4,908,479

N-PHENYL-2,2,6,6-TETRAHALOCYCLOHEXANEIMINE

Takeaki Saeki, Fujiidera; Hideo Ishikawa, Mino, and Tunehei Oki, Osaka, all of Japan, assignors to Osaka Yuki Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 3, 1988, Ser. No. 228,134
Claims priority, application Japan, Oct. 30, 1987, 62-277204; Oct. 30, 1987, 62-277205; Oct. 30, 1987, 62-277206
Int. Cl.[4] C07C *119/14*
U.S. Cl. 564—277 1 Claim

1. An N-phenyl-2,2,6,6-tetrahalocyclohexane imine having the formula (III):



wherein each X is a halogen atom.

4,908,480

PROCESS FOR PRODUCING MONO-ORTHO-ETHYL-ANILINE USING SILICA-ALUMINA CATALYSTS

William F. Burgoyne, Jr., Emmaus, Pa., and Dale D. Dixon, Venice, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 15, 1988, Ser. No. 220,040

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[4] C07C *51/16*

U.S. Cl. 564—409 **4 Claims**

1. In a process for reacting aniline with ethylene to form a ring alkylated aniline, said reaction being carried out in the presence of an acidic catalyst, the improvement for selectivity forming monoethyl aniline where the ethyl group is ortho to the amine at high conversion which comprises:

reacting aniline with ethylene; and

effecting said reaction in the presence of a silica-alumina catalyst maintained in a fixed bed catalytic reactor;

maintaining a mole ratio of aniline to ethylene of from 2 to 10, a temperature from 250° to 400° C.; and

maintaining an LHSV of from 0.05 to 0.5 hr^{-1}.

4,908,481

PREPARATION OF 1-(4-HYDROXY-PHENYL)-BUTAN-3-ONE AND NOVEL INTERMEDIATES

Werner Hoffmann, Neuhofen, and Dieter Degner, Darmstadt-Schauernheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 250,935, Apr. 6, 1981, abandoned. This application Nov. 18, 1985, Ser. No. 798,361

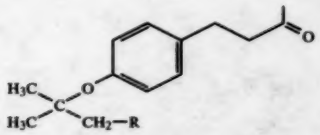
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1980, 3015359

Int. Cl.[4] C07C *49/248*

U.S. Cl. 568—308 **10 Claims**

1. 1-(4-tert.-Alkoxy-phenyl)-butan-3-one and -but-1-en-3-one derivatives of the general formula III

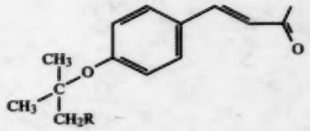
(III)



where R is H or CH_3 and the broken line may or may not be an additional bond between the carbon atoms which it links.

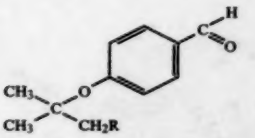
2. A process for the preparation of 1-(4-hydroxyphenyl)-butan-3-one, comprising:

(a) preparing a compound of the formula:



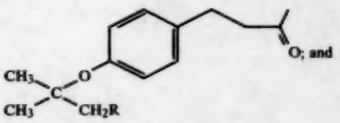
wherein R is H or CH_3 by condensing acetone under alkaline conditions with a compound of the formula:

II



(b) hydrogenating compound IIIa after or while it is formed thereby yielding a compound of the formula:

IIIb



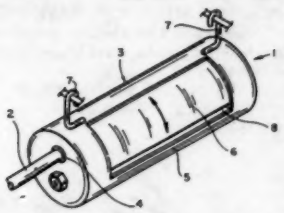
(c) eliminating isobutene or 2-methyl-but-1(2)-ene from compound IIIb at a temperature of 40° to 150° C. in the presence of an acid.

4,908,482

CABLE CLOSURE

Gerald L. Shimirak, Danville; Paul S. Chan, San Francisco, and Darcey Messner, Mountain View, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 8, 1987, Ser. No. 130,348
Int. Cl.[4] H02G *15/10*
U.S. Cl. 174—93 24 Claims



1. A ready-axis cable closure capable of enclosing a connection to a cable and also providing for a seal for a wire or wires entering the closure apart from the connection to the cable, said closure comprising:

(a) a closure body that can surround a connection; and

(b) a seal capable of sealing between the body and the wire/-wires leaving the body,

the closure body having a first part that may be fixed relative to the cable and a second part that is slideably fixed relative to the first part and can be slid from a first position where the first enclosure environmentally is capable of sealing the connection and the wire to a second position where it is supported by the first part and where it allows access to the connection and any wire entering the closure, at least a portion of the closure body is substantially cylindrical and the sliding motion of the second part is rotational about an axis of the cylinder portion of the closure body.

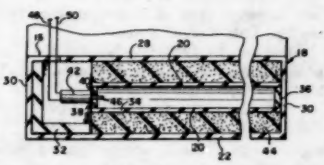
16. A cable closure an outlet for a conductor, said outlet being slot-shaped and having a portion nearer its opening of narrower width and a portion further from the opening of greater width so that a conductor, substantially rectangular or oval in cross-section, can be laterally inserted into the outlet in the closure and after rotation cannot be laterally removed.

4,908,483

SENSING EDGE HAVING A PRESSURE SENSITIVE SWITCH FOR A DOOR

Norman K. Miller, Concordville, Pa., assignor to Miller Edge, Inc., Concordville, Pa.

Filed Aug. 21, 1989, Ser. No. 396,493
Int. Cl.[4] H01H *3/16*; E05F *15/00*
U.S. Cl. 200—61.43 12 Claims



1. A sensing edge for a door to protect persons, equipment and the door from impact damage, comprising:

an elongate outer sheath compressible upon application of external pressure and fabricated of flexible air impervious material for attachment to a door edge;

an elongate inner tubular member fabricated of resiliently compressible air impervious material longitudinally positioned and enclosed within said sheath, said inner tubular member having a first end and a second end, said second end being sealingly closed;

a substantially rigid, incompressible transverse structure positioned within a portion of the outer sheath and having a configuration which complements the interior cross section of said sheath to effectively prevent deformation of said sheath thereabout; and

a pressure sensitive switch having a switch element protectively located within the portion of said sheath proximate to said transverse structure for sensing pressure change within said inner tubular member without subjecting the switch element to direct external pressure whereby upon application of external pressure to the sheath, anywhere therealong except at the portion encompassing said transverse structure, pressure within the tubular member is increased and thereby communicated to the pressure switch for actuation thereof.

4,908,484

DOORBELL ACTIVATING DEVICE FOR PETS

Gordon E. L. Gunoff, R.R. #2, Saskatoon, Saskatchewan, Canada (S7K 3J5)

Filed Aug. 19, 1988, Ser. No. 234,172
Int. Cl.[4] H01H *17/20*
U.S. Cl. 200—331 7 Claims

1. An activating device for use by a pet in actuating a conventional doorbell switch arranged on a building at a height suitable for a human, the device comprising a wire loop member movable to exert pressure against the doorbell switch, a plate member having a sleeve portion thereon defining a receptacle for receiving ends of said wire loop member for mounting said wire loop member on a building at a position adjacent said switch, said ends being arranged in coaxial relationship in said sleeve portion for providing pivotal movement of said wire loop member about an axis defined by said sleeve from a first position in which the switch is not actuated to a second position in which the switch is actuated, said wire loop member including pull means thereon arranged such that a vertically downward pull applied thereto causes the wire loop member to move to the second position, a flexible cord attached to said pull means of a length to extend from the wire loop member to a lower end at a position adjacent the ground, and grasping means for attachment to the lower end for grasping by the pet.

4,908,485

PUSH-BUTTON SWITCH

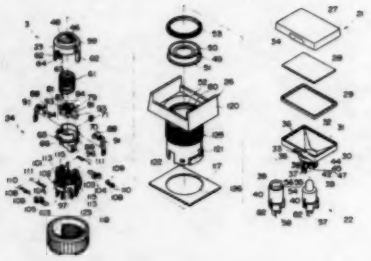
Sueaki Honda, Uji; Mitsuji Hayashi, Nagaokakyo; Yasuhiro Kiyono, Nagaokakyo; Takashi Niwa, Nagaokakyo, and Tomohiko Hayakawa, Fushimi, all of Japan, assignors to Omron Tateisi Electronics Co., Shimokaiinji, Japan

Continuation of Ser. No. 82,950, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 714,667, Mar. 22, 1985, abandoned. This application Jan. 4, 1989, Ser. No. 293,587

Claims priority, application Japan, Mar. 22, 1984, 59-41246; Mar. 28, 1984, 59-61824; Mar. 29, 1984, 59-62598; Mar. 30, 1984, 59-63918; Apr. 2, 1984, 59-45856; Apr. 2, 1984, 59-48780; Apr. 3, 1984, 59-49328; Apr. 3, 1984, 59-49329

Int. Cl.[4] H01H *9/16, 3/12*

U.S. Cl. 200—462 **19 Claims**



1. A push button switch, comprising a switch unit which comprises:

a base;

at least one first terminal and at least one second terminal, said terminals extending essentially vertically from said base;

4,908,486

RESONANT CAVITY OF A MICROWAVE DRIER

Allan R. Fry, The Channon via Lismore, Australia, assignor to Nearctic Research Centre, Australia

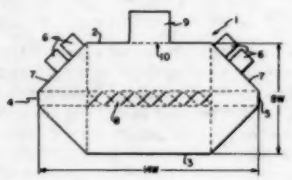
PCT No. PCT/AU87/00167, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO87/07812, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 4, 1987, Ser. No. 180,986

Claims priority, application Australia, Jun. 5, 1986, PH06305

Int. Cl.[4] H05B *6/72*

U.S. Cl. 219—10.55 A **9 Claims**



1. A microwave drier, comprising:

a cavity; and

at least one microwave energy source for emitting microwave energy into said cavity, said cavity having at least two parallel and opposing inner surfaces separated from each other by a predetermined distance so that, in operation, cross-coupling of said microwave energy occurs within said cavity to produce a processing zone in said cavity which is smaller in size than said cavity and to produce reflected and resonant mode energy within said cavity, said processing zone having a greater concentration of resonance modes than is present anywhere else in said cavity, said microwave energy source being arranged so that said reflected and resonant mode energy is minimum at said microwave energy source with respect to any area within said cavity.

4,908,487

EGG POACHER FOR MICROWAVE OVEN

Norton Sarnoff, Northbrook; Carl Fletcher, Arlington Heights, and John Chmela, Mt. Prospect, all of Ill., assignors to Ensar Corporation, Wheeling, Ill.

Filed May 26, 1988, Ser. No. 199,210

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 E **9 Claims**

1. An egg poacher for evenly cooking eggs by direct absorption of microwaves in a microwave oven comprising:

a substantially flat bottomed, tray-like cover element having first engagement means and a depending wall at least a portion of which is outwardly angled;

a bottom receptacle element having egg compartment means and second engagement means, said bottom receptacle element being of sufficient size to accommodate an egg while cooking with the egg being totally out of contact with said cover element and said cover element depending wall being of sufficient height that the egg after cooking may be totally retained in said cover element out of contact with the bottom receptacle element when said egg poacher has been inverted;

said first and second engagement means engageable therebetween to secure said cover to said bottom receptacle;

said egg compartment means being a non-perforate depression including a bottom wall smoothly transitioning to a side wall, said bottom wall and side wall being sized and shaped so as to arrange an egg white thinly around the yolk of an egg;

said egg poacher including means for venting steam to the atmosphere during microwave cooking; and

wherein said cover and said bottom receptacle are molded from microwave transmissible material.

4,908,488

FIXING DEVICE OF A HEATING MEMBER IN A COMBINED MICROWAVE AND CONVECTION COOKING APPARATUS

Hwa S. Park, Kyunggi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jul. 19, 1989, Ser. No. 381,856

Claims priority, application Rep. of Korea, Jul. 22, 1988, 1988-11931

Int. Cl.[4] H05B *6/64*; F27D *7/04*

U.S. Cl. 219—10.55 R **1 Claim**

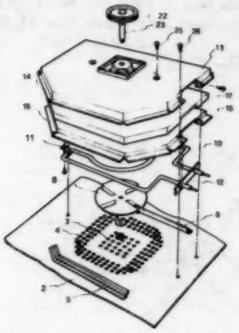
1. A fixing device of a heating member in a combined microwave and convection cooking apparatus comprising:

a case including inner and outer case members having flanges respectively and fixed with each other by means of screws, and a thermal insulator inserted between said inner and outer case members;

an upper plate of a heating cavity having a plurality of inlet and outlet holes formed thereon for the heated air and provided with first and second elongated holders for inserting and supporting said flanges of said inner and outer case members therein; and

a heating member assembly including heating means dis-

posed between said inner case member and said upper plate, fixing end supporting members for respectively fixing and supporting said heating means on said inner



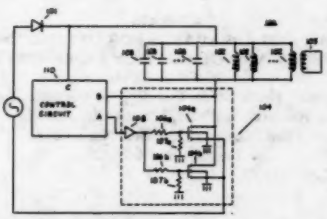
case member, and a fan for circulation of the heated air disposed between said inner case member and said upper plate and connected to a rotating shaft passing through the center of said inner and outer case members.

4,908,489

INDUCTION HEATING DRIVER CIRCUIT

Frank Panecki, St. Clair; Timothy Satawa, Roseville, and Leon Brank, Roseville, Mich., assignors to Food Rethermalization Ltd., Southfield, Mich.

Filed Mar. 31, 1988, Ser. No. 175,267
Int. Cl.[4] H05B 6/06
U.S. Cl. 219—10.77 **10 Claims**



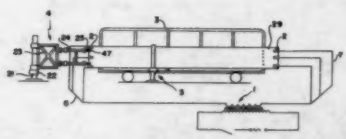
1. An induction heating apparatus comprising:
at least one induction coil having first and second terminals;
a capacitance connected in parallel with said at least one induction coil;
a rectifier circuit adapted for connection to a source of alternating current electrical power for producing half wave rectified alternating current electrical power having a pulsating voltage;
at least one semiconductor switching device having a conducting state and a nonconducting state for selectively connecting said half wave rectified alternating current electrical power across said first and second terminals of said at least one induction coil;
a control circuit including
a triggerable one shot circuit having a trigger input, a reset input and an output connected to said at least one semiconductor switching device for generating a predetermined voltage at said output for a predetermined trigger interval upon receipt of a trigger signal at said trigger input in the absence of a reset signal at said reset input, said predetermined voltage at said output placing said at least one semiconductor switching device in said conducting state for said predetermined trigger interval thereby stimulating electrical oscillation within the combination of said at least one induction coil and said capacitance;
a trigger circuit responsive to the voltage of said half wave rectified alternating current power source, and the voltage at said first terminal of said at least one induction coil, and connected to said trigger input of said trigger one shot circuit for generating a trigger signal for application to said trigger input of said triggerable one shot circuit upon detection of a predetermined relationship between the voltage of said half wave rectified alternating current power source and the voltage at said first terminal of said at least one induction coil,
an initialization circuit responsive to said half wave rectified alternating current electrical power source and connected to said reset input of said trigger one shot circuit for generating said reset signal thereby inhibiting said trigger one shot circuit upon initial energization of said induction heating apparatus until the leading edge of one of the pulses of said pulsating voltage of said half wave rectified alternating current electrical power.

4,908,490

TECHNOLOGY AND EQUIPMENT OF THE STRESSED SKIN SHEET COVERING FOR LARGE PASSENGER VEHICLES

Xicheng Jiang; Changgong Zhang; Yizhi Gao, and Shiqiao Deng, all of Nanling Changchun, China, assignors to Jilin University of Technology, Changchun, China

Filed Jun. 24, 1988, Ser. No. 210,856
Claims priority, application China, Jun. 25, 1987, 87104456
Int. Cl.[4] B23K 11/00
U.S. Cl. 219—50 **4 Claims**



1. An apparatus for stretching and fixing a steel skin sheet on a steel frame of a large vehicle while maintaining the steel skin sheet flat, comprising:
a bracket member including:
a bracket base;
a vertical column mounted on said bracket brace;
a body portion vertically slidably mounted on the vertical column;
a lifting nut for adjusting and fixing said body portion at a predetermined height on the vertical column;
a fixing handle mounted relative to said body portion and said vertical column for setting the height position of said body portion;
a pin member extending horizontally from said body portion for supporting an edge of the steel skin sheet;
a supporting sleeve insulator surrounding said pin member;
a constraining plate insulated from the body portion of the bracket and vertically mounted to the body of said bracket;
a rotatable hooking plate connected to a rotatable handle through an upper end of the vertically mounted constraining plate;
a guiding apparatus including:
a swiveling frame member adjustably mounted on a second vertical column at a first side of said swiveling frame member;

a pair of adjusting tubes hinged to a second opposing side of said swiveling frame member;

two adjusting rods, one fixed to each said adjusting tubes;

a compressible spring surrounding each adjusting rod;

an insulated gripping member fixed to the distal end of each said gripping rod and including a fastening bolt, said gripping member securing a pulling end of the skin sheet and locking the skin sheet therein with the fastening bolt; and

a single phase transformer for introducing an electrical current into said skin sheet, said transformer having a primary voltage of 220 V to 380 V and a secondary voltage of 8 V to 20 V.

4,908,491

INTEGRATED MODULAR TOOL SYSTEM FOR END PREPARATION AND END-TO-END WELDING OF PIPES

Hans O. Knagenhjelm, Porsgrunn, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

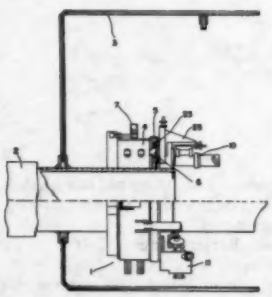
PCT No. PCT/NO88/00008, § 371 Date Jul. 19, 1988, § 102(e) Date Jul. 19, 1988, PCT Pub. No. WO88/05707, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 27, 1988, Ser. No. 223,784

Claims priority, application Norway, Jan. 29, 1987, 870362

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—61 **19 Claims**



15. A method of end preparation and end to end welding of pipes, comprising:

providing an annular clamp having opposite lateral sides, means for rounding a pipe end, a track fixed to one of said lateral sides, and a tool carrier ring plate rotatably mounted on said track, said tool carrier ring plate comprising a tool carrying surface extending in a plane perpendicular to the central axis of the tool carrier ring plate and having means thereon for mounting a plurality of tools;

applying said annular clamp to the pipe end;

clamping and rounding the pipe end with said means for rounding the pipe end;

mounting a plurality of tools on said tool carrier ring plate;

rotating said tool carrier ring plate on said track; and

cutting, machining grooves, welding and performing non-destructive testing on the pipe end with said plurality of tools on said tool carrier ring plate while rotating said tool carrier ring plate on said track.

4,908,492

MICROWAVE PLASMA PRODUCTION APPARATUS

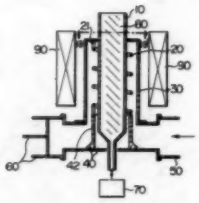
Yukio Okamoto, Sagamihara, and Seiichi Murayama, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,573

Claims priority, application Japan, May 11, 1988, 63-112563

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.52 **5 Claims**



1. A microwave plasma production apparatus comprising:

a cylindrical coaxial wave guide forming a cylindrical bore and including a helical coil shaped inner conductor and a cylindrical outer conductor;

an electrically nonconductive discharge tube disposed in said cylindrical bore; and

means for introducing microwave power between said inner and outer conductors and for forming a microwave electric field in said cylindrical bore so as to form plasma of a substance to be ionized introduced in said cylindrical bore.

4,908,493

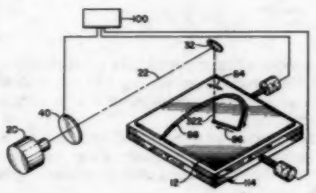
METHOD AND APPARATUS FOR OPTIMIZING THE EFFICIENCY AND QUALITY OF LASER MATERIAL PROCESSING

Ingo Susemihl, Norderstedt, Fed. Rep. of Germany, assignor to Midwest Research Institute, Kansas City, Mo.

Filed May 31, 1988, Ser. No. 200,252

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.67 **21 Claims**



1. The method of applying a laser beam to a work piece, comprising the steps of:

directing a linearly polarized laser beam through polarization controller means capable of adjustably rotating the plane of polarization of the laser beam;

directing the beam emerging from said polarization controller means to steering means capable of redirecting the path of said beam;

manipulating said steering means to redirect said beam onto a work piece; and

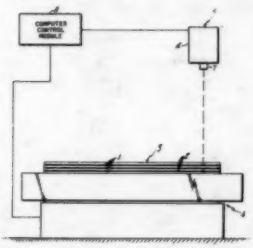
rotating the plane of polarization of said laser beam so that the plane of polarization or E-vector of the beam is parallel to the angle of incidence.

4,908,494

METHOD FOR STABILIZED CUTTING OF FIBROUS COMPOSITE PREFORMS

Robert L. Faiz, Sandy Hook; Nestor J. Diaz, Seymour, and William C. Reinfelder, Woodbridge, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1988, Ser. No. 170,494
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.72 8 Claims



1. A method for stabilized cutting of a plurality of stacked fibrous composite sheets, each sheet including unidirectional or multidirectional fibers, the method being characterized by the steps of:

applying a thermoplastic binder material to each sheet, prior to stacking, with the binder comprising a low weight fraction of the sheet, the binder being noninhibitive to resin flow;

stacking the sheets to a particular fiber orientation; and,

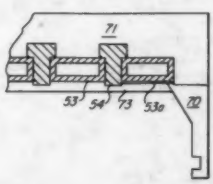
with a laser, simultaneously cutting the bound sheets to a desired pattern, and causing the interposed binder to intercept and fuse to the cut ends thereby preventing cross fusing between said sheets.

4,908,495

HEATING LAMP ASSEMBLY FOR CCVD REACTORS

Kaoru Ishii; Thomas F. Wilkinson, both of Garland; Stephen J. Dwyer, Dallas, and Rick Cooper, Farmers Branch, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1988, Ser. No. 287,747
Int. Cl.[4] H05B *1/00*; F21V *29/00*; G02B *5/10*
U.S. Cl. 219—343 19 Claims



1. A heating lamp assembly for use with semiconductor reactors comprising:

a housing;

a reflector assembly within said housing;

a plurality of cooling tubes within said reflector assembly for cooling said reflector assembly;

a plurality of heat conductive spacers joining said tubes together;

heat lamp mounting assemblies on two sides of said reflector assembly;

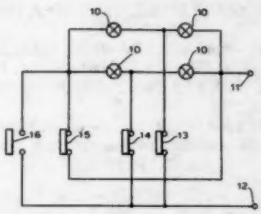
and at least one heating lamp secured to said heat lamp mounting assemblies.

4,908,496

RADIANT ELECTRIC HEATER ASSEMBLIES

George A. Higgins, Hagley, United Kingdom, assignor to Micropore International limited, Worcestershire, United Kingdom

Filed Aug. 16, 1988, Ser. No. 232,783
Claims priority, application United Kingdom, Aug. 25, 1987, 8720054
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—464 4 Claims



1. A radiant electric heater assembly for a glass ceramic top cooker comprising:

a glass ceramic cooking surface;

four radiant electric heating elements;

a thermal cut-out device for protecting the glass ceramic cooking surface from excessive temperatures; and

means associated with the thermal cut-out device adapted to automatically connect the four heating elements in parallel with each other to give a first power level setting, which in the event of the thermal cut-out device detecting a first predetermined temperature is adapted to automatically connect the heating elements in a lower power configuration in which the elements are connected as two elements connected in series with each other and connected in series with a pair of elements connected in parallel with other, and which when the thermal cut-out subsequently detects a second predetermined temperature lower than the first predetermined temperature is adapted to automatically reconnect the heating elements in the configuration of the first power level setting.

4,908,497

FLAT ELECTRICAL RESISTANCE HEATING ELEMENT

Bengt Hjortsberg, Hallstahammar, Sweden, assignor to Kanthal AB, Hallstahammar, Sweden

Filed Feb. 27, 1989, Ser. No. 316,293
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—539 5 Claims

1. A flat electrical heating element comprising:

a supporting surface;

a pair of electrical conductors defining a single continuous loop on said supporting surface, said loop comprising four substantially parallel and spaced apart conductor lengths comprising two relatively adjacently disposed inner

lengths and two outer lengths spaced apart by said inner lengths; and

means for connecting said conductors to a voltage source, said conductors are electrically connected so that the direction of current flow is the same in the outer two conductors and the direction of current flow in the inner two conductors is the same but opposite to the direction of current flow in the outer two conductors.

4,908,498

CONTROL FOR DELIVERY OF POWER TO HEATING ELEMENTS

Erkki Kivelä , Vierumäentie 9, SF-01450 Vantaa, Finland

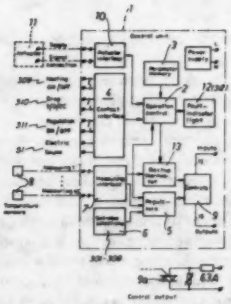
PCT No. PCT/FI86/00112, § 371 Date Jun. 1, 1987, § 102(e) Date Jun. 1, 1987, PCT Pub. No. WO87/02539, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 9, 1986, Ser. No. 67,465

Claims priority, application Finland, Oct. 9, 1985, 853916

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—494 **8 Claims**



1. An apparatus for controlling the delivery of power from a power source to a plurality of electric heating elements, said apparatus comprising:

a plurality of electronic switches for delivery of power from a power source to a plurality of heating elements;

a plurality of temperature sensors associated with said heating elements;

control means, responsive to said temperature sensors, for activating said electronic switches to provide a desired level of heat output; and

selection means coupled to said electronic switches for selectively delivering both the output from each of said switches to a different heating element to deliver relatively low power to heating element, and the output from at least two of said electronic switches to one of said heating elements to deliver relatively high power to the one heating element.

4,908,499

REVALIDATABLE SERVICE SUPPLYING SYSTEM

Christian Guion, Verrières le Buisson, France, assignor to Schlumberger Industries, Montrouge, France

Filed Dec. 18, 1987, Ser. No. 135,095

Claims priority, application France, Dec. 19, 1986, 86 17800

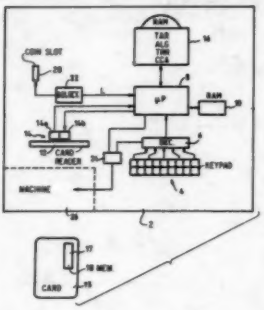
Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 **6 Claims**

1. A revalidatable service supplying system based a plurality of sets of expenditure data items with each expenditure data item being capable of being cancelled solely if a validation data item corresponding to its set has already been cancelled, the system comprising:

a plurality of data mediums, each medium including a plurality of cancellable memory points each having a physical address; and

a plurality of service-supplying machines each including read means for reading the states of said memory points and write means for cancelling memory points; each medium including a fixed data item which is specific to that medium and which is readable by each machine; and each machine including means for defining, as a function of said



fixed data item, a configuration of physical addresses of memory points on the medium corresponding respectively to validation data items and to expenditure data items, together with the relationships between each validation data item and the corresponding set of expenditure data items.

4,908,500

SYSTEM FOR AUTOMATICALLY READING INDENTIFICATION DATA DISPOSED ON A VEHICLE

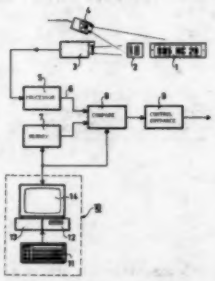
Philippe Baumberger, Bourg la Reine, France, assignor to Campagnie Generale D'Automatisme CGa-HBS, Paris, France

Filed Jun. 24, 1988, Ser. No. 211,193

Claims priority, application France, Jun. 29, 1987, 87 09139

Int. Cl.[4] G07B *15/02*

U.S. Cl. 235—384 **5 Claims**

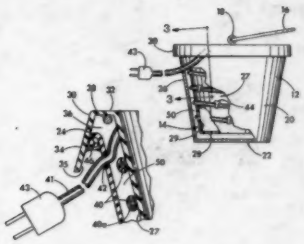


1. A system for automatically reading identification data from a vehicle number plate of a vehicle, the system comprising a television camera for providing an image signal representing an image of said vehicle number plate, a processore unit for receiving and processing said image signal so as to recognize said identification data, and an additional optical marker adjacent to the vehicle number plate, said marker being selected in such a manner as to produce a highly characteristic video signal which is easily analyzed by said processor unit.

4,908,501
PORTABLE ELECTRICALLY HEATED ANIMAL DRINKING WATER CONTAINER

Morris A. Arnold, III, Rt. 2, Box 242I, Prairie du Chien, Wis. 53821

Filed Oct. 19, 1988, Ser. No. 260,000
Int. Cl.[4] A01K *7/00*; H05B *3/56*; A47J *27/21*
U.S. Cl. 219—438 7 Claims



1. A portable heatable water vessel for providing drinking water for animals and adapted to prevent water from freezing at temperatures to −20° F., the water vessel comprising:

(a) a first exterior container having a first upper edge, a first side wall and a first bottom wall, the first exterior container being made of rubber;

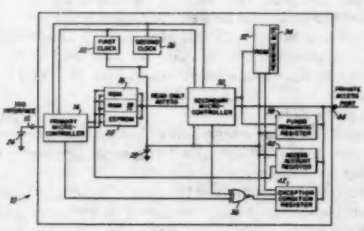
(b) a second interior container having a second upper edge, a second side wall and a second bottom wall, wherein the second side wall has an exterior surface and an interior surface, the second side wall being made of rubber, wherein the second container is nested in spaced relationship within the first container such that the second upper edge comprises a roll-over rim which extends over the first upper edge, wherein the spaced relationship creates an enclosed uninterrupted air pocket between the side walls and bottom walls of the first and second container, wherein the first and second container are nested together in sealing engagement, and wherein the first and second containers are sealed together by a nonporous breakable adhesive; and

(c) an electric heating cable wrapped around the exterior surface of the second side wall and in contact therewith to provide heat to the vessel.

4,908,502
FAULT TOLERANT SMART CARD

Winslow E. Jackson, Monroe, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 8, 1988, Ser. No. 153,391
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—437 22 Claims



1. A fault tolerant smart card comprising:

a standard input-output interface;

clock means for providing a time reference during smart card operations;

main memory means for storing program and data information;

first microcontroller means connected to said interface, said clock means and said main memory means for performing normal smart card functions;

secondary microcontroller means connected to said first microcontroller means, said clock means, said main memory means and to secondary memory means for performing normal smart card functions in synchronization with said first microcontroller means;

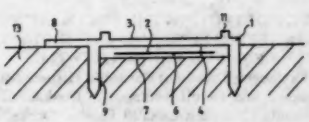
microcontroller error detection means connected to said first microcontroller means and said secondary microcontroller means for detecting a failure of either of said first or secondary microcontrollers; and

primary power supply means connected to said first microcontroller means.

4,908,503
ARTICLE FOR IDENTIFYING PIECES OF TIMBER

Leuvrey Bernard, 20-rue de la scierie-(Bp2), 70280-Raddon, France

Filed Feb. 8, 1988, Ser. No. 153,452
Claims priority, application France, Feb. 11, 1987, 87 01700
Int. Cl.[4] G06K *21/00*
U.S. Cl. 235—489 14 Claims



1. An identification device for identifying pieces of timber, comprising:

a flat, rigid support having an outer face and an inner face and including fastening means for embedding said device in the piece of timber to be identified;

a flat element having an outer face and an inner face, at least a portion of said element being transparent, and said element being formed unitarily with said support and rigidly joined to said support at said outer face thereof; and

information marks affixed to and facing said inner face of said element, wherein said information marks are visible from said outer face of said element.

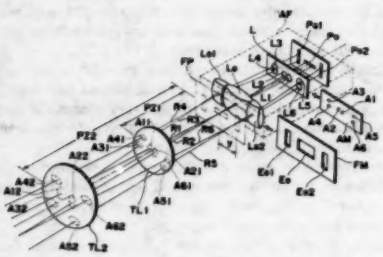
4,908,504
FOCUS DETECTING OPTICAL SYSTEM

Toshihiko Karasaki, and Kazumi Sugitani, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 192,904, May 12, 1988, abandoned.
This application Jun. 19, 1989, Ser. No. 368,095
Claims priority, application Japan, May 15, 1987, 62-119361
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201.2 5 Claims

1. A focus detecting optical system comprising: an objective lens for forming an image of an object; a plurality of focus detecting blocks each including a condenser lens, located nearby a predetermined focal plane of the objective lens, a pair of image re-forming lenses, located behind the condenser lens, for re-forming a pair of secondary images of the image formed by the objective lens, a mask plate having a pair of apertures through which light fluxes forming the secondary images pass, and a light receiving means for receiving the pair of the secondary images formed by the pair of image re-forming lenses to produce a light intensity distribution signal representative of the light intensity distribution of the secondary images, said apertures in the mask plate of at least one specified focus de-

tecting block having a configuration different from that of the other focus detecting blocks; and



a focus condition calculating means for calculating a focus condition of the objective lens in accordance with the light intensity distribution signals produced by the plurality of the focus detecting blocks.

4,908,505

SYSTEM FOR DETECTING THE FOCUS CONDITION OF A CATA-DIOPTRIC LENS AND INTERCHANGEABLE LENS FOR USE THEREWITH

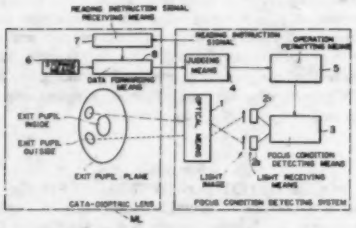
Nobuyuki Taniguchi; Toshihiko Karasaki; Hiromu Mukai; Hisashi Tokumaru, and Tokuji Ishida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 13, 1988, Ser. No. 193,732

Claims priority, application Japan, May 15, 1987, 62-119200; May 19, 1987, 62-121482; May 19, 1987, 62-121483

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **9 Claims**



1. A focus condition detecting system, comprising an optical means for forming at least one pair of images of light from beams of light from at least one pair of different areas of an exit pupil of a cata-dioptric lens, at least one pair of light receiving means for receiving thereon the images of light from said optical means, at least one focus condition detecting means for detecting a relative displacement between the images of light depending upon outputs of said light receiving means to detect a focus condition of said cata-dioptric lens, a judging means for judging, depending upon data read from said cata-dioptric lens regarding outer and inner radii of the exit pupil of said cata-dioptric lens, whether or not optically accurate detection of a focus condition is possible from a combination of said optical means and an optical system of said cata-dioptric lens, and means for rendering said focus condition detecting means operative when said judging means judges that such optically accurate detection of a focus condition is possible.

4,908,506

APPARATUS FOR OPTICALLY SCANNING A RADIATION-REFLECTING INFORMATION PLANE

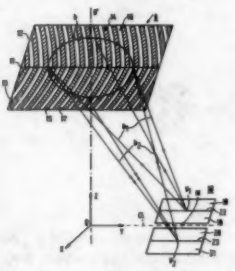
Peter Coops, and Adrianus J. Duijvestijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,466

Claims priority, application Netherlands, Nov. 3, 1988, 8802689

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201.5 **6 Claims**



1. An apparatus for optically scanning a radiation-reflecting information plane, which apparatus comprises a diode laser supplying a scanning beam, an objective system for focusing the scanning beam to a scanning spot in the information plane and for re-imaging the scanning spot on a composite radiation-sensitive detection system, and a composite diffraction element arranged in the radiation path between the diode laser and the objective system for deflecting a part of the radiation beam reflected by the information plane towards the radiation-sensitive detection system and for splitting the deflected beam into a plurality of sub-beams which respectively form respective radiation spots re-imaged on respective detector pairs of the composite detection system, the two detectors of each pair having a separating strip there-between which is oriented so that displacements of the re-imaged radiation spot thereon resulting from wavelength variations of the scanning beam do not have any influence on the detector signals; characterized in that the separating strips of the detector pairs are substantially parallel to a connecting line from the centre of the radiation-emitting surface of the diode laser to the centre of the composite radiation-sensitive detection system.

4,908,507

PROCESS AND APPARATUS FOR THE INTEGRAL OPTICAL EXAMINATIONS OF DAMAGING MECHANICAL STRESSES IN THE BOTTOM-PART OF BOTTLES AND HOLLOW GLASSWARE

Dobi Imre, Orosháza; Péter Karabélyos, Budapest; János Kugyela, and Béla Tóh, both of Orosháza, all of Hungary, assignors to Ovegipari Muvek, Budapest, Hungary

Continuation of Ser. No. 22,796, Mar. 6, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 256,155

Claims priority, application Hungary, Mar. 10, 1986, 1001/86

Int. Cl.[4] G01H *9/04*

U.S. Cl. 250—223 B **12 Claims**

1. A process for the integral optical examination of mechanical stresses in the bottom of a transparent container, which comprises the steps of;

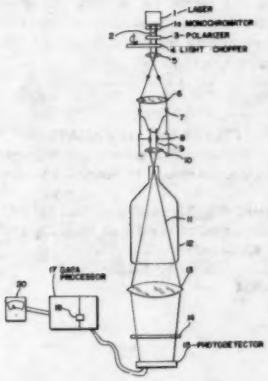
(a) polarizing the output light beam of a light source;

(b) substantially uniformly, periodically, optically interrupting the polarized light beam at a preselected frequency;

(c) optically expanding the diameter of said light beam;

(d) reducing the angular divergence of said expanded light beam;

(e) sampling a substantially uniform intensity portion of said light beam;
(f) substantially uniformly illuminating the bottom of said container with said sampled light beam portion through the mouth of the container;



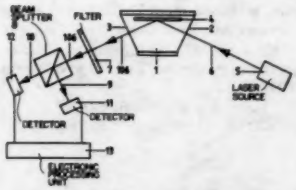
(g) collecting the light beam after it passes through the bottom of said container;
(h) passing the collected light beam through an analyzing polarizing filter; and
(i) quantitatively determining the stress characteristics of the bottom of said container.

4,908,508

PROCESS AND APPARATUS FOR DETERMINING THICKNESSES OF LAYERS

Gerrit C. Dubbeldam, Zevenaar, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 23, 1987, Ser. No. 137,346
Claims priority, application Netherlands, Feb. 12, 1987, 8700337
Int. Cl.[4] G01B *11/06*
U.S. Cl. 250—225 **20 Claims**



6. An apparatus for use in determining the thickness of a layer, comprising a substrate for carrying said layer, a beam splitter, a laser source for directing a plane polarized beam toward said substrate, said plane polarized beam being reflected by said substrate and said layer toward said beam splitter, said beam splitter splitting the reflected polarized beam into a p-polarized beam and an s-polarized beam, a first detector for detecting an intensity of said p-polarized beam and a second detector for detecting an intensity of said s-polarized beam and a processing unit for calculating a quantity

$$M = \frac{(I_s)_r - (I_p)_r}{(I_s)_r + (I_p)_r} = \frac{R_s - mR_p}{R_s + mR_p}$$

in which

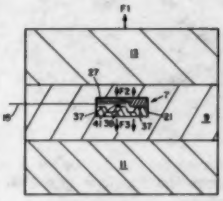
R_s is the ratio of the intensities $(I_s)_r$ and $(I_s)_i$ of the reflected and incident s-polarized light, respectively;
R_p is the ratio of the intensities $(I_p)_r$ and $(I_p)_i$ of the reflected and incident p-polarized light, respectively;
m is the ratio of the intensities $(I_p)_i$ and $(I_s)_i$ of the incident p- and s-polarized light, respectively; and the quantity
M is a function of the thickness of the thin layer.

4,908,509

TRACTION AND REACTION FORCE MICROSENSOR

Stephen D. Senturia, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 27, 1988, Ser. No. 263,545
Int. Cl.[4] G01B *1/00*
U.S. Cl. 356—373 **52 Claims**



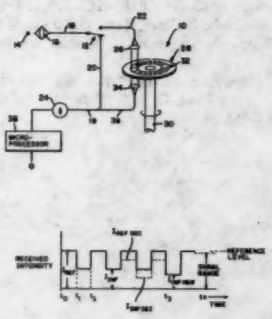
1. A sensor for detecting adhesion between a subject and a substrate being adhered together with an adhesive, the sensor comprising:
a housing suspended within and adhered to the adhesive, the housing having first and second members displacable relative to each other with application of a force and a reaction force across the adhesive; and
means for sensing the displacement of the first and second members.

4,908,510

OPTICAL FIBER COUPLED RESOLVER HAVING A REFERENCE SIGNAL

Raymond W. Huggins, Mercer Island, and Glen E. Miller, Redondo, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 2, 1988, Ser. No. 239,629
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231.13 **22 Claims**



1. An optical encoder comprising:
a movable element having a means for modulating light comprising a variably transmissive material on the movable element;
a means for alternately transmitting light through a first path

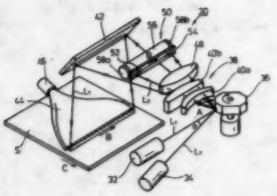
which by-passes the variably transmissive material and a second path which includes the variably transmissive material.

4,908,511

LIGHT BEAM SCANNING DEVICE

Hiromi Ishikawa, and Masaru Noguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 8, 1988, Ser. No. 229,876
Claims priority, application Japan, Aug. 7, 1987, 62-198800
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—235 **7 Claims**



1. A light beam scanning device for scanning an object to read image information therefrom or record image information thereon, comprising:

light source means for generating a synchronizing light beam and a scanning light beam;

a light deflector for deflecting the synchronizing light beam and said scanning light beam;

a first focusing optical system disposed between said light deflector and the object for focusing said scanning light beam on the object;

a synchronizing signal generator including a reference grating plate, for generating a synchronizing signal from the synchronizing light beam applied to said reference grating plate;

a second focusing optical system disposed between said first focusing optical system and said reference grating plate for focusing the synchronizing light beam applied through said first focusing optical system on said reference grating plate; and

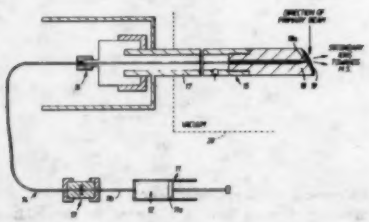
means for reading the image information from or recording the image information on said object based on said synchronizing signal.

4,908,512

APPARATUS AND METHODS OF USE IN THE MASS ANALYSIS OF CHEMICAL SAMPLES

Richard M. Caprioli, Bellaire, Tex., and John S. Cottrell, Manchester, England, assignors to Kratos Analytical Limited, England

Filed Aug. 21, 1985, Ser. No. 767,819
Int. Cl.[4] H01J *49/04*
U.S. Cl. 250—288 **6 Claims**



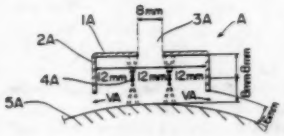
1. Mass spectrometry apparatus for use in the continuous analysis of a sample of which the composition may, or may not, change with time, which comprises a high vacuum system; means for depositing a supply of the sample on a surface located within the high vacuum system, the depositing means including a vessel for containing the sample and a duct extending between the vessel and the surface, the duct including a capillary tube, and means for forcing the sample from the vessel along the duct to the surface; means for ionising the deposited sample in situ on the surface; and means for mass analysing the ions so produced.

4,908,513

CHARGING APPARATUS

Keiji Masuda; Kazuhiro Nakazawa, and Hiroaki Ura, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,693
Claims priority, application Japan, Sep. 25, 1987, 62-241924; Sep. 25, 1987, 62-241926
Int. Cl.[4] G03G *15/02*
U.S. Cl. 250—324 **6 Claims**



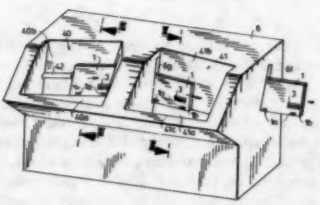
1. In a charging apparatus comprising a discharging wire, a shielding member U-shaped in cross section, and a wire cleaning member for cleaning said wire, the improvement wherein a back plate forming a back portion of said shielding member has an elongate opening for guiding said cleaning member and defining a cleaning region of said wire and a cam groove communicating said elongate opening for separating the cleaning member from the wire.

4,908,514

PROCESSING AND TREATING DEVICE FOR X-RAY FILM CASSETTES

Walter Bauer; Jürgen Müller, both of Munich, and Volkmar Voigtländer, Eichenau, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,806
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733191
Int. Cl.[4] G03B *42/02*
U.S. Cl. 250—327.2 **19 Claims**



1. A handling device for X-ray film cassettes with a sheet shaped receiving material sensitive to X-rays, comprising means forming an input slot for introducing a cassette; means forming a separate output slot for removing a cassette, said input and output slots extending substantially in the vertical

direction; a cassette input stack container for accommodating cassettes to be inserted into said input slot and associated with the latter; and a cassette output stack container for receiving cassettes withdrawn from said output slot and associated with the latter, said input stack container having a bottom surface which extends downwardly towards said input slot and a rearwardly inclined rear wall which borders and aligns with said input slot, said input stack container being provided with transporting means for a first cassette accommodated in a cassette stack and having its end side aligned with said input slot, said output stack container also having a rearwardly inclined rear wall and a downwardly forwardly inclined bottom surface provided with a catching railing for the cassettes.

4,908,515

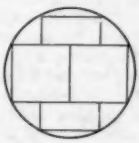
METHOD OF EFFICIENTLY STORING SPENT NUCLEAR FUEL RODS IN A CYLINDRICAL CONTAINER

N. Barrie McLeod, Bethesda, Md., assignor to NUS Corporation, Gaithersburg, Md.

Continuation of Ser. No. 813,901, Dec. 27, 1985. This application Dec. 10, 1987, Ser. No. 131,484

Int. Cl.[4] G21F *9/36*

U.S. Cl. 250—507.1 **21 Claims**



1. A method of improving the geometric efficiency of spent nuclear fuel rods stored in a cylindrical container having the cross section of a circle, said method comprising the steps of:

a. removing spent fuel rods stored in a plurality of fuel assemblies each having the cross section of a square whose side-length is l;

b. providing full-square storage cans having the cross section of a square with a side-length l, and inserting in each of said cans all of the removed fuel rods from two of said fuel assemblies;

c. providing half-square storage cans having the cross section of a rectangle with side-lengths l and l/2, respectively, and inserting in each of said half-square storage cans all of the removed fuel rods from one of said fuel assemblies;

d. predetermining the optimal combination of said full-square and half-square storage cans which maximizes the number of full-square and half-square storage cans capable of being circumscribed by said circle and which also contains the maximum number of full-square cans; and

e. inserting into said circle, forming said cross section of said container, full-square and half-square cans in accordance with said predetermined combination, thereby producing a maximum can-occupancy of said container with the maximum number of said full-square cans.

4,908,516

APPARATUS AND PROCESS FOR CHECKING THE AUTHENTICITY OF AN ARTICLE HAVING A MAGNETIC STORAGE INFORMATION MEANS

Michael A. West, 59 Dale Wood Rd., Orpington Kent, BR6 OBY, United Kingdom

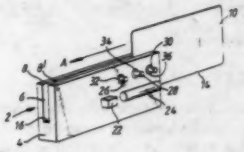
PCT No. PCT/GB87/00238, § 371 Date Jan. 22, 1988, § 102(e) Date Jan. 22, 1988, PCT Pub. No. WO87/07415, PCT Pub. Date Dec. 3, 1987

PCT Filed Apr. 7, 1987, Ser. No. 150,653

Claims priority, application United Kingdom, May 23, 1986, 8612693

Int. Cl.[4] G06K *5/00*

U.S. Cl. 250—556 **15 Claims**



1. Apparatus for checking the authenticity of an article carrying a magnetic storage material which stores permanent characteristic information, the apparatus comprising means for irradiating the article with electromagnetic radiation of a particular spectral characteristic, means for detecting electromagnetic radiation which is emitted by or reflected from the article due to the irradiation thereof by the means for irradiating, means for determining whether the detected radiation has prescribed spectral characteristics and said means being operable to produce an authentication signal if the prescribed spectral characteristics are detected to indicate that the article is genuine and a magnetic detector means operable in response to said authentication signal to weed said characteristic information which is stored on the magnetic material.

4,908,517

APPARATUS FOR EXAMINING THE SURFACE OF A SUBSTRATE

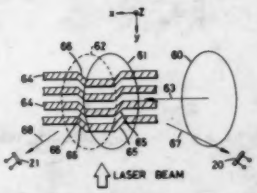
Kazunori Imamura, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,874

Claims priority, application Japan, Aug. 6, 1987, 62-197084

Int. Cl.[4] G01N *21/88*

U.S. Cl. 250—563 **8 Claims**



1. An apparatus for examining the surface of a substrate, comprising:

irradiating means for supplying a light beam which scans the surface of said substrate;

first and second light-receiving means for individually receiving scattered lights travelling in different first and second directions from the surface of said substrate and individually producing first and second output signals conforming to the intensities of the received lights; and

means for discriminating the directional characteristics of

said scattered lights on the basis of the time phase shift between said first and second output signals.

4,908,518

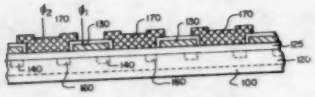
INTERLINE TRANSFER CCD IMAGE SENSING DEVICE WITH ELECTRODE STRUCTURE FOR EACH PIXEL

David L. Losee; Timothy J. Tredwell, both of Fairport, N.Y., and David M. Boisvert, Stanford, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,646

Int. Cl.[4] H01J *40/14*

U.S. Cl. 358—213.23 **5 Claims**



1. An interline transfer type area image sensor having an array of columns and rows of separate pixels and wherein charge collected in a pixel is transferred into a CCD, such CCD comprising a series of overlapping electrodes, with each electrode being formed from a single level of conductor, separate voltage clocks connected to alternate electrodes, each pixel being associated with only one electrode, an ion implanted barrier region being formed under an edge of each electrode, and means for transferring charge from each pixel into a region under its corresponding electrode.

4,908,519

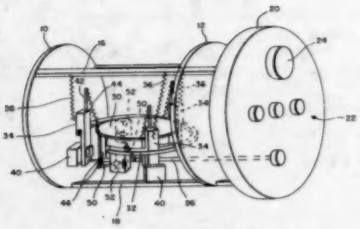
LOADING MECHANISM AND SUPPORT STRUCTURE HAVING IMPROVED VIBRATION DAMPING USEFUL IN SCANNING TUNNELING MICROSCOPY

Sang-il Park, Palo Alto, and Calvin F. Quate, Stanford, both of Calif., assignors to The Board of Thustees of the Leland Stanford Jr. University, Stanford, Calif.

Filed Oct. 11, 1988, Ser. No. 256,352

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—306 **13 Claims**



1. A system for a platform in a scanning tunneling microscope comprising

a rigid support structure,

a first platform within said rigid support structure,

a second ring platform positioned around and spaced from said first platform and including a plurality of support members extending therefrom,

a first plurality of springs attached to said rigid support structure and to said second platform for supporting said second platform, and

a second plurality of springs attached to said second platform and to said first platform for supporting said first platform, said first plurality of springs and said second plurality of springs overlapping and thereby reducing the overall length of the spring support of said first platform from said rigid support structure.

4,908,520

RADIATION IMAGE RECORDING, READ-OUT AND REPRODUCING APPARATUS

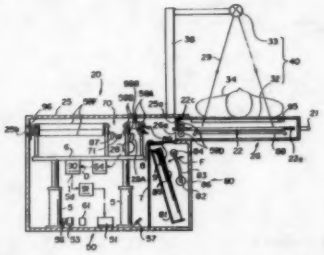
Shigeru Saotome, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1988, Ser. No. 182,820

Claims priority, application Japan, Apr. 17, 1987, 62-94553; Apr. 17, 1987, 62-94554

Int. Cl.[4] G03G *5/16;* **H05B** *33/00*

U.S. Cl. 250—327.2 **74 Claims**



1. A radiation image recording, read-out and reproducing apparatus which comprises:

i) a case for housing a stimulable phosphor sheet capable of storing a radiation image thereon, and provided at one case end with an opening though which a light shielding cover is to be passed,

ii) the light shielding cover housed in said case for projection out of said case through said opening for passage of the light shielding cover, and provided with a sheet passage opening at an end on the side supported by said case at the time said light shielding cover is projected out of said case,

iii) an image recording section for exposing said stimulable phosphor sheet, which is disposed at an exposure position inside of said light shielding cover projected out of said case, to radiation carrying image information, thereby to have the radiation image stored on said stimulable phosphor sheet,

iv) an image read-out section provided with a read-out subscanning means for moving said stimulable phosphor sheet between said exposure position and a position in said case to which said stimulable phosphor sheet advances through said sheet passage opening, and a read-out main scanning means for scanning said stimulable phosphor sheet by a beam of stimulating rays in a main scanning direction at a position inside of said case in the vicinity of said opening for passage of the light shielding cover, wherein said stimulable phosphor sheet carrying said radiation image stored thereon is exposed to the beam of stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and the emitted light is detected by a photoelectric read-out means to obtain image signals,

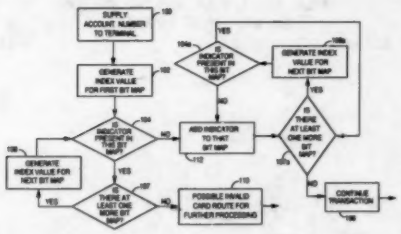
v) an erasing section for releasing the radiation energy remaining on said stimulable phosphor sheet, for which the image read-out has been carried out at said image read-out section, before the image recording is carried out on said stimulable phosphor sheet, and

vi) an image reproducing section for conveying a recording sheet housed in said case to feed said recording sheet out of said case through a recording sheet feed-out opening of said case and, at the same time, reproducing the image, which said image signals represent, on said recording sheet.

4,908,521
TRANSACTION APPROVAL SYSTEM

Elvis W. Boggan, Concord, Calif., and Carl M. Campbell, Newtown Square, Pa., assignors to Visa International Service Association, San Mateo, Calif.

Continuation-in-part of Ser. No. 596, Jan. 6, 1987, Pat. No. 4,822,985. This application Jan. 10, 1989, Ser. No. 295,662
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—380 22 Claims


SUPPLY ACCOUNT NUMBER TO TERMINAL
GENERATE INDEX VALUE FOR FIRST BIT MAP
IS INDICATOR PRESENT IN THIS BIT MAP?
GENERATE INDEX VALUE FOR NEXT BIT MAP
ADD INDICATOR TO THAT BIT MAP
IS THERE AT LEAST ONE MORE BIT MAP?
GENERATE INDEX VALUE FOR NEXT BIT MAP
IS THERE AT LEAST ONE MORE BIT MAP?
POSSIBLE INVALID CARD ROUTE FOR FURTHER PROCESSING
CONTINUE TRANSACTION

2. A method of operating a transaction terminal for facilitating the off-line approval of transactions based upon the use of transaction cards each having an account number, comprising the steps of:

receiving information about a list of transaction cards in the form of a master table wherein each listed card is represented by at least one indicator;

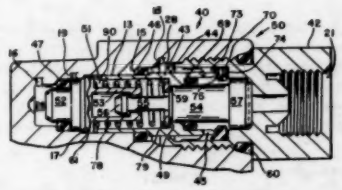
detecting transmission errors; and

compensating for any ambiguous errors by placing an indicator in the table in each of the locations where a transmission error may have occurred so that information about listed cards will not be lost.

4,908,522
PRESSURE-BALANCED PROPORTIONING VALVE WITH VENT-CONTROLLED BYPASS

Donald A. Crumb, Granger, Ind.; Robert F. Gaiser, Stevensville, Mich., and John E. Steer, South Bend, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Nov. 21, 1988, Ser. No. 274,078
Int. Cl.[4] B60T 8/26
U.S. Cl. 303—9.72 12 Claims

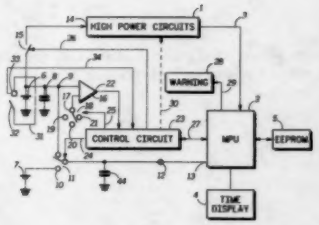


1. A proportioning valve in combination with a master cylinder, the master cylinder comprising a primary pressure chamber and a secondary pressure chamber, communication means for communicating fluid from the respective pressure chambers to a bore having said proportioning valve disposed therein, the bore having at one end a primary pressure receiving chamber and at the other end a secondary pressure receiving chamber, the secondary pressure receiving chamber having an outlet opening, a twopart piston disposed within said bore and having a primary part received in the primary pressure receiving chamber and a secondary part received in the secondary pressure receiving chamber, the primary and secondary parts coupled together so as to allow movement between the parts, sleeve means disposed about said two-part piston, sealing means disposed about said sleeve means and primary part to define an intermediate chamber communicating with a vent having a vent opening at said bore, the secondary part comprising a differential area piston and having a seal member disposed thereabout and engaging said sleeve means, and a sealing member disposed about said secondary part and retained in place by said sleeve means, so that failure of pressure in the primary chamber causes the primary part to be displaced and close communication with said vent opening whereby fluid is captured within said sleeve means and prevents said secondary part from being displaced.

4,908,523
ELECTRONIC CIRCUIT WITH POWER DRAIN CONTROL

Gregory O. Snowden; Joan S. DeLuca, and Gary L. Pace, all of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1988, Ser. No. 176,960
Int. Cl.[4] H02J 1/00, 7/00, 1/10
U.S. Cl. 307—43 19 Claims



1. A power switching circuit for selectively coupling an output terminal to a first or a second battery, the circuit comprising: a first input terminal for connection to the first battery; a second input terminal for connection to the second battery; an output terminal; first switching means responsive to the voltage of the first battery for selectively switching the output terminal from the first to the second input terminal in response to the voltage of the first battery falling to a first predetermined level, said first switching means including a comparator coupled to compare the voltage of a primary one of said first or second batteries at the first input terminal with a first reference voltage; second switching means controllable by said first switching means; a second output terminal coupled to the first input terminal through said second switching means, said second switching means for isolating the second output terminal from the first battery in response to the voltage of the first battery falling to a second predetermined level.

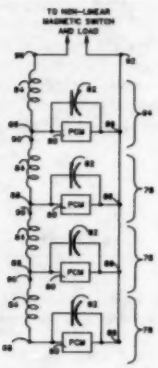
4,908,524
HIGH VOLTAGE PULSE POWER CONVERTER

Richard J. Sojka, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 8, 1989, Ser. No. 307,819
Int. Cl.[4] H02M 9/04
U.S. Cl. 307—107 6 Claims

1. A high voltage pulse power converter comprising a nonlinear magnetic switch (76) and a ladder (74) of pulse forming network charging elements (78), the nonlinear magnetic switch

(76) and the ladder (74) being connected in series, and each charging element (78) including means (98, 100) for receiving



low voltage power (102), and means (110) for transforming said low voltage power to high voltage power.

4,908,525

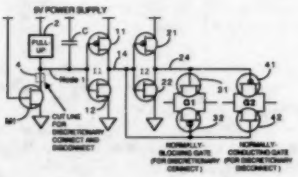
CUT-ONLY CMOS SWITCH FOR DISCRETIONARY CONNECT AND DISCONNECT

Michael W. Yung, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 3, 1989, Ser. No. 307,372

Int. Cl.[4] H03K *17/22*

U.S. Cl. 307—202.1 **5 Claims**



1. A switch circuit forming part of an integrated CMOS semiconductor circuit device comprising an N-channel CMOS transistor in series with a pull-up device having a high impedance, a capacitor in parallel with the pull-up device between a power supply terminal and a first node, said transistor having a drain electrode connected via a metal line to the first node, a gate electrode connected to the power supply terminal, and a source electrode connected to ground, so that the transistor is normally conducting and the first node is low at substantially ground potential, a cut window in said metal line so that by a cut of the metal line at said window the first node goes high to substantially the power supply potential via the pull-up device and is held high during operation via the capacitor;

means coupling the first node to components, including redundant components which are normally blocked with the first node low, and in response to the first node going high defective components are replaced with redundant good ones.

4,908,526

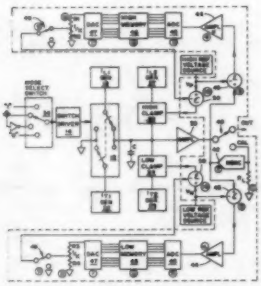
PULSE GENERATOR OUTPUT VOLTAGE CALIBRATION CIRCUIT

Joseph P. Mefford, Glen Cove, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 3, 1988, Ser. No. 202,786

Int. Cl.[4] H03K *5/08, 5/12*

U.S. Cl. 307—263 **6 Claims**



1. A calibration circuit for a pulse generator circuit which produces pulse rise and pulse fall times by charging and discharging a capacitor at selected currents and clamps the pulse high voltage output at a selected high voltage level, comprising:

a. a pulse generator circuit including a capacitor, in which the generated pulse rise and pulse fall times are produced by charging and discharging said capacitor at selected currents, and the pulse high voltage output signal is clamped at a selected high voltage level;

b. means for comparing the high voltage output of the pulse generator to a high reference clamping voltage to develop an analog high voltage output error signal;

c. means for converting the analog high voltage output error signal to a digital high voltage error signal for storage;

d. a digital memory for storing the digital high voltage error signal;

e. means for reconverting the stored digital high voltage error signal into a high voltage analog error signal; and

f. means for recombining the high voltage analog error signal with the high reference clamping voltage to compensate the high reference clamping voltage, thereby removing the error from the pulse high voltage output.

4,908,527

HALL-TYPE TRANSDUCING DEVICE

Joel C. Van Antwerp, Frisco, Tex., assignor to Xolox Corporation, Fort Wayne, Ind.

Filed Sep. 8, 1988, Ser. No. 241,589

Int. Cl.[4] H03K *17/97, 17/90*

U.S. Cl. 307—309 **43 Claims**

1. A magnetic sensing device performance stabilized against variations in ambient temperature, comprising:

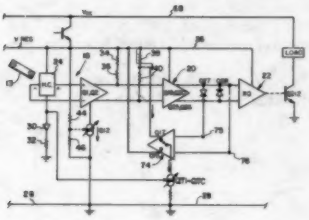
a permanent magnet having a temperature coefficient according to which the strength of the magnetic field varies with changes in ambient temperature;

transducing means disposed in operative relationship to said magnet and responsive to said field for generating a signal representative of a predetermined strength thereof;

said transducing means having a temperature coefficient

whereby its field response in generating said signal also varies with changes in ambient temperature;

said temperature coefficients substantially tracking within a given range of temperatures whereby the response characteristic of said transducing means in generating said signal varies in accordance with changes in said predetermined strength as ambient temperature changes within said range.



4,908,528

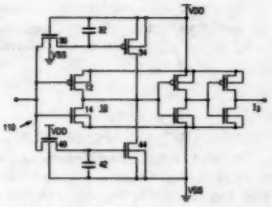
INPUT CIRCUIT HAVING IMPROVED NOISE IMMUNITY

Eddy Huang, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 21, 1988, Ser. No. 222,567

Int. Cl.[4] H03K *17/16*; H03B *1/04*

U.S. Cl. 307—443 **10 Claims**



1. In an improved electronic integrated input circuit of the type having Complementary Metal Oxide Silicon (CMOS) transistors forming an input circuit, said input circuit having a plurality of inverters with each inverter having an MOS transistor of the P type and an MOS transistor of the N type, with the gate of the P-type transistor connected to an input node, its drain connected to a positive voltage source, its source connected to the drain of the N-type MOS transistor and to an output node, with the output node being the output of said inverter, the gate of the N-type MOS transistor being connected to the input node and the source of said N-type MOS transistor being connected to a ground potential; wherein said improvement comprising:

a first MOS transistor means of the N type having a source, a drain, and a gate with the source connected to said ground potential, and the drain connected to the output node of said inverter;

first means for capacitively coupling a ground transient to the gate of said first MOS transistor; and

first pass transistor means for providing AC isolation between said input node and the gate of said first MOS transistor means.

4,908,529

LOGARITHMIC AMPLIFIER COMPRISING MESFET DISTRIBUTED AMPLIFIERS CONNECTED IN CASCADE

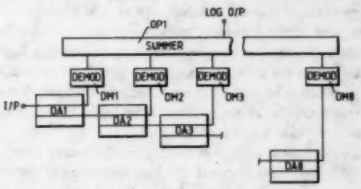
Colin S. Aitchison, 37 Cronks Hill Road, Redhill, Surrey, England

Filed Mar. 9, 1989, Ser. No. 321,506

Claims priority, application United Kingdom, Mar. 10, 1988, 8805669

Int. Cl.[4] G06G *7/24*; H03K *5/08*

U.S. Cl. 307—492 **8 Claims**



1. A logarithmic amplifier comprising:

a series of MESFET distributed amplifiers connected in cascade, said MESFET distributed amplifiers having a substantially linear transfer characteristic,

an input for said logarithmic amplifier being provided by an input end of a gate transmission line of a first distributed amplifier,

demodulator means, said demodulator means being operatively connected to terminate said gate transmission line of each distributed amplifier, said demodulator means demodulating amplitude modulated signals, and,

summing means operatively connected to each of said demodulator means, said summing means summing outputs of said demodulator means and thereby providing an output of said logarithmic amplifier.

4,908,530

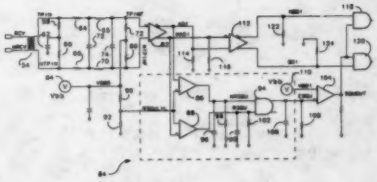
NON-LINEAR SQUELCH CIRCUIT FOR IEEE-802, 3 PROTOCOL

Fred G. Huang, Folsom, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 13, 1987, Ser. No. 84,961

Int. Cl.[4] H03K *17/16, 19/3*

U.S. Cl. 307—443 **15 Claims**



1. A non-linear filter receiving a differential signal comprising:

means for generating a first reference-voltage;

filter means responsive to said received differential signal for generating differential signals representing said received signals having a frequency between a first and a second predetermined frequency;

squelch means responsive to said filtered signals for generating a signal at a first level upon reception of no more than a predetermined number of consecutive half-cycles of said filtered signal and at a second level upon reception of more than said predetermined number of consecutive

half-cycles of said filtered signal, said squelch means comprising:

first comparator means responsive to a first of said filtered differential signals and said first reference voltage for generating at an output a binary-valued signal indicative of whether said first filtered differential signal exceeds said first reference voltage;

second comparator means responsive to a second of said filtered differential signals and said first reference voltage for generating at an output a binary-valued signal indicative of whether said first reference voltage exceeds said second filtered differential signal;

first and second passive means coupled to said first and second comparator means output, respectively, for delaying by a first selected amount the time said signal generated at said first and second comparator means, respectively, changes from a first said binary value to a second said binary value; and

peak-detection means receiving said signals generated at said first and second comparator means outputs for generating at an output said two-level squelch signal when both said received signals exceed in absolute value a second predetermined reference voltage within said first selected delay time, indicating said reception of no more than said predetermined number of consecutive half-cycles of said filtered signal, and

logic means responsive to said filtered signals and said squelch signal for suppressing said filtered signals upon reception of said first level of said squelch signal and for not suppressing said filtered signals upon reception of said second level of said squelch signal.

4,908,531

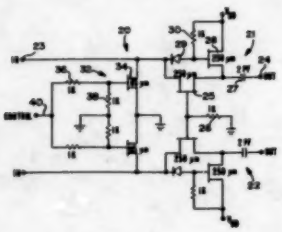
MONOLITHIC ACTIVE ISOLATOR

Allen F. Podell, Palo Alto; Sanjay B. Moghe, San Jose, and Fazal Ali, Santa Clara, all of Calif., assignors to Pacific Monolithics, Sunnyvale, Calif.

Filed Sep. 19, 1988, Ser. No. 246,425

Int. Cl.[4] H03K *17/04, 17/687*

U.S. Cl. 307—571 **12 Claims**



1. An active isolator circuit for electrically isolating an input terminal from an output terminal comprising:

a common-gate transistor means having a gate means coupled to ground, a source means coupled to the input terminal, and a drain means coupled to the output terminal; and

a source-follower transistor means having a gate means coupled to said source means of said common-gate transistor means, a drain means coupled to a voltage source, and a source means coupled to said drain means of said common-gate transistor means.

4,908,532

QUADRATURE SIGNALS GENERATOR

Peter E. Chadwick, Wiltshire, United Kingdom, assignor to Plessey Overseas Limited, Ilford, United Kingdom

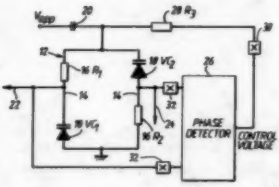
PCT No. PCT/GB87/00640, § 371 Date Jul. 8, 1988, § 102(e) Date Jul. 8, 1988, PCT Pub. No. WO88/02196, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 14, 1987, Ser. No. 195,640

Claims priority, application United Kingdom, Sep. 16, 1986, 8622293

Int. Cl.[4] H03L *7/00*

U.S. Cl. 307—512 **7 Claims**



1. A quadrature signals generator, responsive to an applied input signal, for producing two phase-shifted output signals differing from each other by a relative phase of 90°;

said generator including a phase-shifting network being interconnected between signal input and ground, and, having a pair of arms each of which is comprised of a resistor, an output channel, and a capacitance element in series therewith;

said generator being characterized by:

a phase detector, having inputs connected to respective output channels of the network, responsive to any difference from 90° relative phase between said two output signals, to produce a control signal and, each capacitance elements being adjustable and arranged relative to said detector to allow variation of the capacitance in both network arms so to maintain the two output signals in quadrature relative phase.

4,908,533

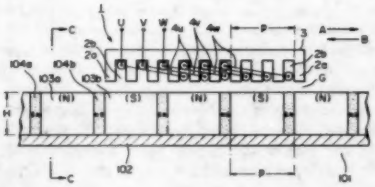
TRANSPORTING APPARATUS

Mitsuji Karita; Tsutomu Shinya, and Tetsuo Oishi, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1988, Ser. No. 144,234

Int. Cl.[4] H02K *41/03*

U.S. Cl. 310—12 **8 Claims**



1. A transporting apparatus using a linear motor comprising:

(a) a primary unit for generating a progressive magnetic field; and

(b) a secondary unit having a predetermined plane which faces a plane of said progressive magnetic field with a certain gap,

said secondary unit comprising a plurality of permanent magnets and cores which arranged in turn along a progressing direction of said progressive magnetic field

so that a said core is disposed between adjacent permanent magnets, and

said permanent magnets being magnetized such that poles of adjacent permanent magnets are in facing relation to one another,

said poles in facing relation having the same polarity so that a core disposed therebetween is magnetized as said polarity, whereby planes of said cores facing said plane of said progressive magnetic field are magnetized in a north pole and a south pole in turn.

4,908,534

SPINDLE WITH ELECTROMOTOR DRIVE FOR A SPINNING MACHINE

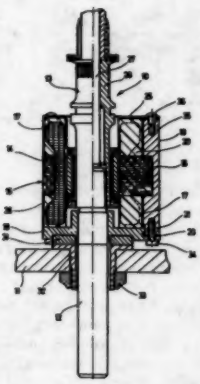
Hans R. Gubler, Gebenstorf, Switzerland, and Gustav Fetzer, Gingen, Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,056

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818196

Int. Cl.[4] H02K *5/08*; D01H *1/244, 7/10*

U.S. Cl. 310—45 13 Claims



1. A spindle drive apparatus for a spinning machine of the type having a bobbin supporting spindle rotatably mounted in a bearing housing in the spindle bank of the spinning machine and on which spindle a rotor is fixedly mounted for rotation therewith, said apparatus comprising:

a stator, mounted on the spindle bank and surrounding the rotor, for rotating the rotor and the spindle, said stator including a plurality of electrically conductive coils and a stack of magnetically active plates shaped for receiving said plurality of coils;

an interconnecting member, connected to the spindle bank on one axial end of said stator, for mounting said stator on the spindle bank,

said coils having a first portion projecting from said stack of plates in a direction toward said interconnecting member and a second portion projecting from said stack of plates in a direction away from said interconnecting member;

a protective cover encasing said first and second projecting portions of said coils, said protective cover including a first protective cover portion extending from said stack of plates in said direction towards said interconnecting member for substantially encasing said first projecting portion of said coils and a second protective cover portion extending from said stack of plates in said direction away from said interconnecting member for substantially encasing said second projecting portion of said coils; and

means for securing said second protective cover portion to said interconnecting member including a plurality of brackets, one end of each bracket being fixedly connected to said interconnecting member and the other end of each bracket being fixedly connected to said second protective cover portion.

4,908,535

INSULATED DYNAMO WINDINGS

Helmut Kreuzer, and Klaus-Peter Meier, both of Schwieberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

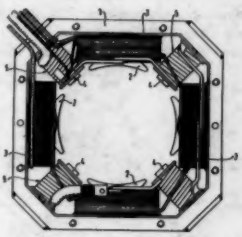
Continuation of Ser. No. 4,063, Jan. 16, 1987, Pat. No. 4,782,254, which is a division of Ser. No. 724,799, Apr. 19, 1985, Pat. No. 4,682,410, which is a division of Ser. No. 409,561, Aug. 19, 1982, abandoned. This application Oct. 26, 1988, Ser. No. 262,963

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147221.4

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] H02K *15/10*

U.S. Cl. 310—45 2 Claims



1. Direct-current dynamo electric machine, having at least two poles (2,4) and a pole winding (5) on each one of the poles, wherein each pole (2,4) is made by the steps of

winding a strip of conductive material (6), having essentially rectangular cross-sectional configuration,

permitting the thus-formed winding to resiliently expand to form a spiral winding loop,

exposing said expanded spaced spiral winding loops to a fluidized bed in which a powder, comprising a curable, hardenable insulating material, is suspended, said powder precipitating in the fluidized bed on said expanded winding loops,

hardening said powder to form a uniform coalesced insulating coating on the conductive material (6) forming the pole winding, and

mounting the thus-insulated winding on a pole core (2,4).

4,908,536

VIBRATION SUPPRESSING BY ELECTRICAL TERMINATION IMPEDANCE

Albert A. Hudimac, 12100 Devilwood Dr., Rockville, Md. 10845

Continuation-in-part of Ser. No. 793,058, Oct. 30, 1985, Pat. No. 4,816,725. This application Jan. 25, 1988, Ser. No. 148,428

Int. Cl.[4] G01D *15/00*; H02K *5/24*

U.S. Cl. 310—51 17 Claims

1. The method for suppressing vibration comprising

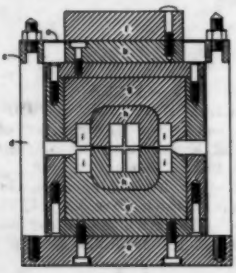
applying vibration to an electro-mechanical transducer,

sensing the frequency of vibration,

selecting a termination impedance capable of providing the transducer with a desired mechanical impedance at said frequency, and

automatically connecting circuit means having said termina-

tion impedance to the transducer, wherein the transducer converts said vibration into an electrical signal and the



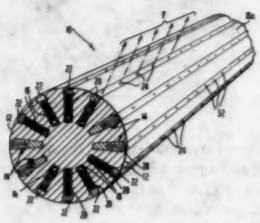
sensing comprises counting the axis crossings of said signal over a predetermined time interval.

4,908,537

POLE VENTILATION OF RADIALLY VENTILATED ROTORS

Albert C. Sismour, Jr., Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1988, Ser. No. 186,868
Int. Cl.[4] H02K *1/32*
U.S. Cl. 310—51 **10 Claims**



1. A method of reducing noise produced by a radially ventilated rotor in a dynamoelectric machine, wherein the rotor includes two or more regions of a first type defined by a plurality of longitudinal slots each of which contain an axial ventilating channel, slot contents including a plurality of field winding conductors, and means for holding the slot contents within their respective slots, each of the slot contents and holding means having formed therein a plurality of radial ventilating slots in order to provide a flow of ventilating fluid through the slot contents and holding means between said channel and the exterior of said rotor, and wherein the rotor includes two or more regions of a second type each of which defines a pole region between adjacent pairs of the regions of the first type, said method comprising the steps of:

providing means for radially ventilating each of the pole regions;

providing a flow of fluid through said radially ventilating means, said flow of fluid through said radially ventilating means distributed uniformly about the rotor with respect to the flow of ventilating fluid through the slot contents and holding means between said channel and the exterior of said rotor;

wherein said step providing means for radially ventilating each of the pole regions comprises the steps of:

forming a plurality of slots in the rotor, each said slot having a predetermined cross-section extending longitudinally with respect to the rotor in a respective one of the pole regions;

providing an insert for each said slot, each said insert having a cross-section corresponding to said predetermined cross-section, and including means for circulating said flow of fluid therethrough; and

inserting each said insert within its respective slot;

wherein said step providing said insert comprises the steps of:

forming said insert from a preselected magnetic material;

forming a ventilation duct within said insert extending longitudinally thereof;

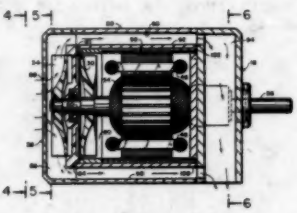
forming a plurality of ventilation holes within said insert, each said ventilation hole connected to and extending radially outward from said ventilation duct.

4,908,538

TOTALLY ENCLOSED ELECTRIC MOTOR

John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446

Filed Feb. 28, 1989, Ser. No. 317,184
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—59 **16 Claims**



1. In a totally enclosed electromotive device having a stator and a rotor in a stator-rotor arrangement, said stator being fixedly supported by an internal cylindrical wall of a main housing for said device and the rotor being rotatably mounted in front and rear housings of said device on suitable bearings therein, said front and rear housings being detachably secured to said main housing, the improvement comprising:

an internal ventilation system comprising an internal fan driven by said rotor disposed in an internal fan compartment defined between said stator-rotor arrangement and said rear housing, a series of annular internal longitudinally extending ducts surrounding the internal cylindrical wall of the main housing and communicating with said fan compartment, and means for directing the internal ventilating air from said internal ducts to said stator-rotor arrangement to return to said internal fan compartment, and

an external ventilation system comprising an external fan driven by said rotor disposed in an external fan compartment defined by said rear housing and an exterior rear cover, said rear housing sealing said external fan compartment from said internal ventilation system, a series of annular external longitudinally extending ducts in said main housing discharging into exhaust compartment which exhausts to the atmosphere arranged in said front housing, said exhaust compartment means being sealed from said internal ventilation system by said front housing.

4,908,539

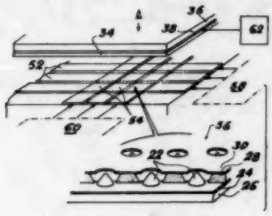
DISPLAY UNIT BY CATHODOLUMINESCENCE EXCITED BY FIELD EMISSION

Robert Meyer, Saint Ismier, France, assignor to Commissariat A l'Energie Atomique, France

Continuation of Ser. No. 758,737, Jul. 25, 1985, abandoned. This application Mar. 24, 1988, Ser. No. 177,880
Claims priority, application France, Jul. 24, 1984, 84 11986
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.3 **8 Claims**

1. A display unit comprising a plurality of elementary patterns, each pattern having an anode comprising a cathodolu-

minescent layer and a cathode able to emit electrons, each cathode comprising a plurality of electrically interconnected micropoints subject to an electron emission by field effect when the cathode is negatively polarized relative to the corresponding anode, each anode being integrated onto the corresponding cathode and being electrically insulated therefrom, said anode and its cathodoluminescent layer having openings opposite said micropoints, whereby electons emitted by said micropoints first pass through said openings and thereafter return towards said cathodoluminescent layer and strike that layer around said openings, and further including a plurality of electrically conductive grids, respectively associated with the



patterns, each grid being integrated onto a corresponding cathode and being electrically insulated from a corresponding anode by an electrically insulating layer with said cathodoluminescent layer being placed on the insulating layer, and each anode also comprising an electrically conductive transparent layer placed on the cathodoluminescent layer, each grid being disposed between the corresponding cathode and a corresponding anode electrically insulated from said cathode and positively polarized with respect to the latter, and being negatively polarized with respect to the anode or raised to the potential of that anode, and having holes opposite the micropoints.

4,908,540

ELECTRIC GENERATOR FOR VEHICLES

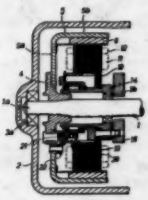
Shoji Motodate, Saitama; Nobuaki Komuro, and Yukio Miyamaru, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 128,141, Dec. 3, 1987, abandoned. This application Oct. 12, 1988, Ser. No. 256,226

Claims priority, application Japan, Feb. 27, 1987, 62-44612

Int. Cl.[4] H02K *13/00*; F02N *11/04*

U.S. Cl. 310—240 **14 Claims**



1. An electric generator apparatus for a vehicle having an engine comprising:

a stator having starting coils, generating coils and a current supply path for supplying electric current from a battery to said starting coils during startup of said engine;

a rotor having field magnets operatively positioned with respect to said starting and generating coils on said stator;

a rectifier mechanism incuding a brush holder containing a brush for electric coupling with said current supply path; and

means for connecting said brush holder to said rotor for rotation therewith during a predetermined range of engine operation, said means including means for disconnecting said brush holder from said rotor when said engine operation is outside said predetermined range.

4,908,541

AIR-COOLED LAYERED COIL VEHICLE AC GENERATOR STATOR

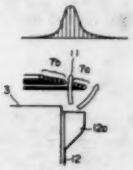
Takashi Kawazoe, Kiryu; Shigeru Akutsu, Gumma, and Nobuhisa Hongo, Kiryu, all of Japan, assignors to Mitsuba Electric Mfg., Co., Ltd., Gumma, Japan

Filed Aug. 24, 1987, Ser. No. 88,958

Claims priority, application Japan, Aug. 28, 1986, 61-202338; Sep. 8, 1986, 61-211212

Int. Cl.[4] H02K *3/04, 3/24*

U.S. Cl. 310—270 **11 Claims**



1. An alternating current generator for vehicles comprising a rotor rotatable along a central axis, a stator core positioned along said central axis said rotor, a stator coil disposed within said stator core and having a portion extended parallel to said central axis from said stator core, and a cooling fan attached to said rotor and being generally perpendicular to said central axis so that the cooling air flow generated by said cooling fan flows radially outward towards said extended portion of said stator coil, said extended portion of said stator coil comprising:

a first wire batch composed of wires extended to a first distance from said stator core; and,

a second wire batch composed of wires extended to a second greater distance from said stator core so that a space is created between said first and second wire batches through which said cooling air may flow to cool said wire batches of said stator coil.

4,908,542

SAW TAPERED TRANSDUCERS

Leland P. Solie, Mahomet, Ill., assignor to Unisys, Blue Bell, Pa.

Filed Jun. 24, 1987, Ser. No. 65,748

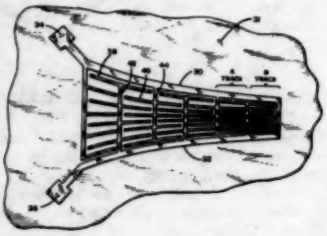
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] H03H *9/145*

U.S. Cl. 310—313 B **6 Claims**

1. A Surface Acoustive Wave (SAW) transducer which comprises first and second electrodes, each of which comprise a plurality of interdigital electrode fingers positioned such that the spacing between said fingers varies from point-to-point along said transducer and the spacing between said fingers is substantially constant at any given point in order to provide a varying frequency response, wherein said interdigital electrode fingers comprise a pair of outer electrode fingers and a plurality of inner electrode fingers, said outer electrode fingers are relatively wider than said inner electrode fingers, said inner electrode fingers are subdivided into a plurality of sections, and said transducers comprise interconnection electrode connection means from connecting each of said sections to one of said outer electrode fingers, said outer electrode fingers being

aligned generally normal to the paths of said surface acoustical waves as they are launched along said SAW transducer, and said inner electrode fingers comprising transducing segments



which are also aligned generally normal to the path of said surface acoustical waves and linking segments which are aligned generally normal to said inner electrode transducing segments.

4,908,543

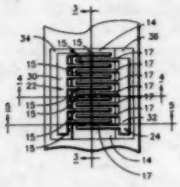
ACOUSTIC TRANSDUCER

Farhang Sabet-Peyman, San Jose, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 30, 1988, Ser. No. 70,891

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **12 Claims**



1. An acoustic transducer for a bulk acoustic wave body, comprising:

a bulk acoustic wave body;

a piezoelectric acoustic oscillator member, formed on said body and having two largest surfaces for receiving electrodes, the distance between said largest surfaces defining the resonant frequency of said member;

a common electrode covering a first said largest surface of said oscillator member between said oscillator member and said body;

a plurality of electrode sets, each having a plurality of active electrodes in a predetermined discrete electrode distribution, attached to the second of said largest surfaces of said oscillator member; and

non-piezoelectric dielectric pedestals, built into said body and positioned in or juxtaposed to said piezoelectric oscillator member for supporting connector-electrodes to said active electrodes and sufficiently far from said active electrodes that electric f ields in the region of said active electrodes, but produced by voltages on said connector-electrodes, are negligible.

4,908,544

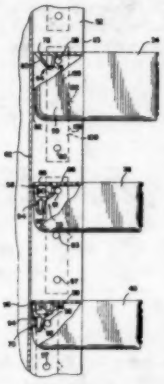
STORAGE BIN MOUNTING SYSTEM FOR A REFRIGERATOR AND METHOD OF ASSEMBLY

Robert G. Lau, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 3, 1988, Ser. No. 227,920

Int. Cl.[4] A47F *3/00*

U.S. Cl. 312—321.5 **26 Claims**



1. In a refrigeration apparatus having a cabinet with a cabinet member having a rear wall and a pair of side members extending outwardly from opposite sides of said rear wall, a storage member mounting system comprising:

a first pair of vertically aligned first pins, each having generally cylindrically shaped bodies extending inwardly from opposite side members of said cabinet member at a given first distance from said rear wall of said cabinet member;

a second pair of vertically aligned second pins, each having generally cylindrically shaped bodies extending inwardly from opposite side members of said cabinet member at a given second distance from said rear wall of said cabinet member, said first distance being greater than said second distance;

a first storage member having opposed side walls with a first hook disposed on the outer surface of each of said side wall, each of said first hooks having a first pin engaging ramp surface extending generally downwardly from an upper edge of a respective side wall at a distance from the rear of said side wall that is approximately equal to said given first distance to allow said first hooks to be wedged between said first pins and the rear wall of said cabinet member while preventing said first hooks from being wedged between said second pins and the rear wall of said cabinet member;

a second storage member having opposed side walls with a second hook disposed on the outer surface of each of the side walls, each of said second hooks having a first pin engaging ramp surface and a serially disposed second pin engaging ramp surface extending generally downwardly from an upper edge of a respective side wall, said first pin engaging ramp surface being at a distance from the rear of said side wall that is approximately equal to said given first distance and said second pin engaging ramp surface being at a distance from the rear of said side wall that is approximately equal to said given second distance to enable said second hooks selectively to be wedged either between said first pins and the rear wall of said cabinet member or between said second pins and the rear wall of said cabinet member.

4,908,545
CATHODE RAY TUBE

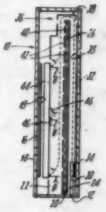
Alfred W. Woodhead, Caterham; Ronald W. A. Gill; Alan G. Knapp, both of Crawley; Daphne L. Lamport, Caterham, and Derek Washington, Wallington, all of United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 626,964, Jul. 2, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 913,614

Claims priority, application United Kingdom, Jul. 8, 1983, 8318495

Int. Cl.[4] H01J *29/06, 43/28*

U.S. Cl. 313—103 CM 17 Claims



1. A cathode ray tube comprising an envelope including an optically transparent faceplate supporting a luminescent screen, said envelope containing:

(a) a channel plate electron multiplier having an output side spaced from said luminescent screen and having an input side including a multiplicity of openings defining entrances to respective channels having walls including secondary emissive material;

(b) means for producing a scanning electron beam and for directing said beam at the input side of the channel plate electron multiplier such that the beam is received at the input side from substantially a predetermined direction and at substantially a predetermined angle of incidence;

said beam, when scanned across areas of said input side disposed between the openings, producing backscattered electrons which return to said input side from random directions and at random angles; and

(c) acceptance angle limiting means arranged near the channel entrances for allowing electrons arriving from substantially the predetermined direction and at substantially the predetermined angle of incidence of the electron beam to strike the secondary emissive material in the channels, but inhibiting electrons arriving from other directions and at other angles from striking the secondary emissive material in the channels, thereby minimizing multiplication in said channels of the backscattered electrons.

4,908,546
LEAD-IN WIRE FOR COMPACT FLUORESCENT LAMPS

John W. Shaffer, Montoursville, Pa.; Peter V. Calesbu, Lynnfield, and David W. Johnston, Amesbury, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jun. 27, 1988, Ser. No. 211,797

Int. Cl.[4] H01J *5/50*

U.S. Cl. 313—331 18 Claims

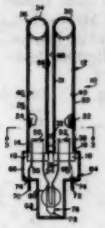
1. A fluorescent lamp comprising:

a sealed envelope of light-transmitting vitreous material having a pair of end portions;

a phosphor layer disposed on the internal surface of said envelope;

an ionizable medium contained within said envelope; and

an electrode structure sealed within each of said end portions and including an electrode supported by a pair of lead-in wires; said lead-in wires having a core comprising nickel and iron, said core having a metallic plating thereon sufficient to prevent formation of Fe_2O_3 during sealing so as to prevent cracks from forming in the seal between said



envelope and said lead-in wires at an elevated temperature during lamp operation.

4,908,547
BEAM INDEX TYPE COLOR CATHODE RAY TUBE

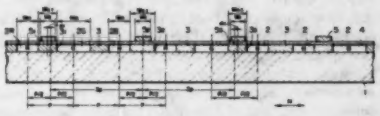
Takashi Toyama, Tokyo; Minoru Ohzeki, Kanagawa, and Takahiro Yukawa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,880

Claims priority, application Japan, Sep. 4, 1984, 59-184859

Int. Cl.[4] H01J *29/30*

U.S. Cl. 313—471 4 Claims



1. A beam index type color cathode ray tube including a screen having a screen surface adapted to be scanned by a single electron beam making successive sweeps in a widthwise direction of said screen surface to generate successive horizontal lines of an image, comprising:

a large number of red, green and blue phosphor stripes having widths W_R, W_G and W_B, respectively, arranged cyclically in said widthwise direction on the screen surface of the cathode ray tube and extending in parallel with one another perpendicular to said widthwise direction and in sets of three phosphor stripes including one of each color, adjoining ones of said stripes being separated in said widthwise direction by a parallel guard band, each guard band having a width at least as large as a minimum width;

m index stripes associated with n of said sets of three color phosphor stripes being arranged over respective ones of said guard bands, n and m being natural numbers that are relatively prime;

widthwise center-to-center distances between the adjoining color phosphor stripes being equal to one another;

the width of at least one of the red, green and blue phosphor stripes being different from the widths of the other color phosphor stripes;

the index stripes being of a constant width approximately as large as the minimum width of the guard bands; and

the index stripes being arranged with widthwise centers thereof coincident with widthwise centers of the respective guard bands, said index stripes being irregularly spaced in said widthwise direction in a pattern repeating every^m index stripes.

4,908,548

FLUORESCENT DISPLAY DEVICE

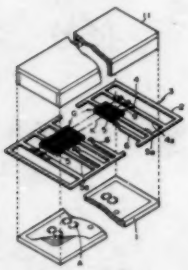
Tadashi Mizohata, Mobara, and Daiji Sakamoto, Yasugi, both of Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara and Hitachi Metals, Ltd., Tokyo, both of, Japan

Filed May 9, 1988, Ser. No. 191,868

Claims priority, application Japan, May 9, 1987, 62-111677; May 9, 1987, 62-111678

Int. Cl.[4] H01J *63/02*

U.S. Cl. 313—497 **9 Claims**



1. A fluorescent display device comprising:

a glass substrate;

phosphor-deposited anodes provided on said glass substrate;

control electrodes provided above said anodes;

filamentary cathodes stretchedly arranged above said control electrodes; and

an envelope kept at a high vacuum to accommodate said anodes, control electrodes and filamentary cathodes;

said control electrodes being made of an alloy of which the coefficient of average thermal expansion is smaller than that of said glass substrate and that of 426 alloy at a temperature within the range of from 30° C. to 250° C. and is substantially equal to or larger than that of said glass substrate and that of 426 alloy at a temperature within the range of from 30° C. to the sealing temperature of the fluorescent display device.

4,908,549

MOTOR-DRIVEN DEVICE FOR PREADJUSTED FREQUENCY TUNINGS FOR A KLYSTRON

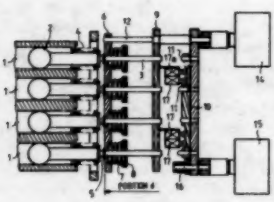
Michel Bres, Versailles, and Francois Tisserand, Asnieres, both of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 5, 1988, Ser. No. 279,565

Claims priority, application France, Dec. 8, 1987, 87 17053

Int. Cl.[4] H01J *25/10*

U.S. Cl. 315—5.47 **7 Claims**



1. A motor-driven device for preadjusted frequency tunings for a klystron, comprising a plurality of resonant cavities, each cavity being adjusted in frequency by means of a piston rigidly fixed to a rod whose position is controlled by a spring which bears on a plate, exerts its force on a cup which is rigidly fixed to the piston rod and locks said rod against the head of an adjusting screw wherein, irrespective of the frequency tuning chosen and in the case of each cavity, the distance between the plate and the head of the adjusting screw is constant, the locking position of the plate being movable according to the frequency which is chosen and the spring being compressed between the plate and the cup in a constant manner.

4,908,550

CATHODE RAY TUBE APPARATUS

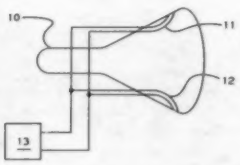
Elaine Chase, 7 Chillington Gardens, Chandlers Ford, Hampshire; Adrian M. Clitheroe, 394 Hunts Pond Road, Titchfield Common, Fareham, Hampshire; Edward T. Shepherd, 14 Bormans Way, South Wonston, Winchester, Hampshire, and Peter Beanlands, 67 Merdon Avenue, Chandlers Ford, Hampshire, all of United Kingdom

Filed Oct. 27, 1987, Ser. No. 114,352

Claims priority, application United Kingdom, Oct. 30, 1986, 8626018

Int. Cl.[4] H01J *29/06*

U.S. Cl. 315—8 **10 Claims**



1. A cathode ray tube apparatus including a cathode ray tube (**10**) with a degauss coil (**11, 12**) for reducing magnetization of the apparatus and circuitry (**13**) coupled to the degauss coil, in which the degauss coil is positioned, constructed and arranged and said circuitry (**13**) produces a signal that drives said coil having a decaying time varying component and a non-zero dc component to produce residual magnetism (**14**) in opposition to the vertical component of the terrestrial and other ambient magnetic fields (**15**), thereby to produce a resultant vertical component of the magnetic field (**16**) in the region of the cathode ray tube of lower amplitude than said vertical component of the terrestrial and other ambient magnetic fields (**15**).

4,908,551

DC/AC BRIDGE CIRCUIT

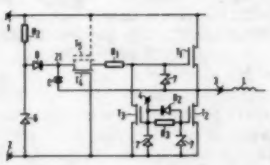
Adrianus W. Ludikhuize; Job F. P. van Mil, and Franciscus A. C. M. Schoofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1988, Ser. No. 267,059

Claims priority, application Netherlands, Nov. 27, 1987, 8702847

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—209 R **13 Claims**



1. A DC/AC converter bridge circuit comprising, an integrated circuit having connection terminals for the application of a high direct voltage and a low direct voltage, a first insulated gate field effect transistor whose drain is connected to a

first connection terminal, a second insulated gate field effect transistor whose source is connected to a second connection terminal, the source of the first field effect transistor and the drain of the second field effect transistor both being connected to an output terminal, a control circuit for supplying an alternating control signal to a gate of the second field effect transistor and in inverted form to a gate of the first field effect transistor whereby the first and second field effect transistors can be made conducting and non-conducting in push-pull, said control circuit comprising an inverter stage having a third insulated gate field effect transistor whose source is connected to the second connection terminal, whose gate is connected to the gate of the second field effect transistor and whose drain is connected to a load element and to the gate of the first field effect transistor, characterized in that the current path of the inverter stage includes, in series with the load element and the third field effect transistor, a switch comprising a fourth transistor of a type complementary to the first, second and third field effect transistors and having a control electrode connected to a point of the circuit such that, during operation, a voltage is applied to the control electrode such that in the state in which the second and third field effect transistors are conducting the fourth field effect transistor is non-conducting or at least substantially non-conducting, and in that in the other state in which the second and third field effect transistors are non-conducting the fourth transistor is conducting.

4,908,552

ELECTRONIC FLASH UNIT

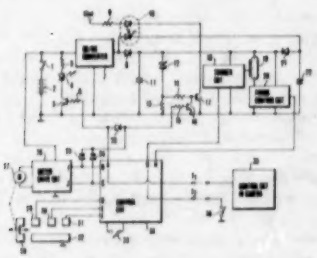
Toshiyuki Kumakura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 62,934, Jun. 16, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,872

Claims priority, application Japan, Jun. 27, 1986, 61-150728; Jun. 27, 1986, 61-150729

Int. Cl.[4] H05B *37/00*; G03B *15/05*

U.S. Cl. 315—241 P **9 Claims**



1. A flash photographic system using an electronic flash unit having capacitor means to be charged with the output of an electrical power source circuit and a flash tube for emitting flash light by discharging the charge stored on said capacitor means, therethrough comprising:

(a) load means to be driven by the output of said electrical power source circuit;

(b) first and second capacitors constituting said capacitor means, the capacitance of said first capacitor being set to a small value compared with the capacitance of said second capacitor, and both of said capacitors being charged with the output of said electrical power source circuit;

(c) inhibiting means for inhibiting said second capacitor from being charged with the output of said electrical power source circuit under the condition that the charging of said first capacitor with the output of said electrical power source circuit is maintained; and

(d) drive means for driving said load means by the output of said electrical power source circuit, said inhibiting means operating to inhibit charging of said second capacitor during the time when said load operates by said drive means.

4,908,553

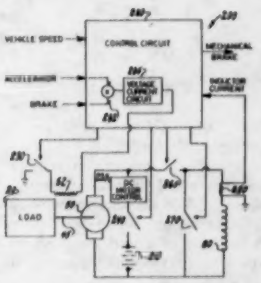
MAGNETIC REGENERATIVE BRAKING SYSTEM

Lyle O. Hoppie, West Bloomfield, and Donald Speranza, Portage, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 20, 1988, Ser. No. 286,992

Int. Cl.[4] H02P *3/00*

U.S. Cl. 318—382 **10 Claims**



1. A regenerative braking system adapted for connection to a load having variable kinetic energy, comprising:

a DC machine having a rotor mechanically coupled to the load for rotating at a speed proportional to the velocity of the load, an independently energized field coil and an armature coil;

an inductor; and

a control circuit connected to said load, said DC machine and said inductor for

decreasing the velocity of the load by energizing said field coil and connecting said inductor across said armature coil, thereby converting kinetic energy of the load into magnetic energy within said inductor via said DC machine,

storing said magnetic energy in said inductor by connecting a short circuit across said inductor, and disconnecting said inductor from across said armature coil, and

increasing the velocity of the load by energizing said field coil, switching said DC machine to an opposite polarity and connecting said inductor across said armature coil, thereby converting the magnetic energy of said inductor into kinetic energy of the load via said DC machine.

6. A regenerative braking system adapted for use in a vehicle having a variable speed of motion comprising:

a DC machine having a rotor mechanically coupled to said vehicle for rotation with vehicle motion, a field coil and an armature coil;

an inductor; and

a control circuit connected to said vehicle, said DC machine and said inductor for

decelerating said vehicle by energizing said field coil in a first polarity and connecting said inductor across said armature coil,

storing energy in said inductor by connecting a short circuit across said inductor, and disconnecting said inductor from said armature coil, and

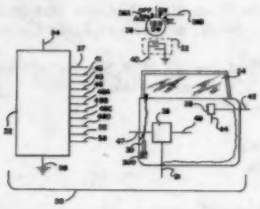
accelerating said vehicle by energizing said field coil in a second polarity opposite to said first polarity, disconnecting said short circuit across said inductor, and connecting said inductor across said armature coil.

4,908,554

MOISTURE SENSING APPARATUS AND INTERIOR PROTECTION SYSTEM

Jeff Chance, P.O. Box 1540, LaPorte, Ind. 46350

Filed Oct. 30, 1986, Ser. No. 924,793
Int. Cl.[4] E05F 15/20; H02P 1/22
U.S. Cl. 318—483 2 Claims



1. An improved moisture-responsive system for closing an opening of a vehicle in response to sensing of moisture in excess of a predetermined level comprising;

moisture sensing means for sensing moisture and for providing a moisture output signal in response to sensing of moisture in excess of a predetermined level;

closure means for closing said opening in response to a command signal; and

circuit means coupled to said closure means and to said moisture sensing means for providing said command signal in response to said moisture output signal, said circuit means further including means for sensing an obstruction of the closing of said opening and temporarily terminating said command signal, reversing said closure means for a predetermined time to effect at least a partial unclosing of said opening whenever said moisture output signal is provided, and reinstating said command signal after said predetermined time;

said means for sensing an obstruction including a hydraulic pressure sensing means for sensing fluid in a hydraulic closure actuator and for providing a fluid pressure overload signal in response to sensing of fluid pressure in excess of a predetermined level.

2. An improved moisture-responsive system for closing an opening of a vehicle in response to sensing of moisture in excess of a predetermined level comprising;

moisture sensing means for sensing moisture and for providing a moisture output signal in response to sensing of moisture in excess of a predetermined level;

closure means for closing said opening in response to a command signal;

circuit means coupled to said closure means and to said moisture sensing means for providing said command signal in response to said moisture output signal, said circuit means further including means for sensing an obstruction of the closing of said opening and temporarily terminating said command signal, reversing said closure means for a predetermined time to effect at least a partial unclosing of said opening whenever said moisture output signal is provided, and reinstating said command signal after said predetermined time;

said moisture sensing means comprising:

a pair of parallel electrically conductive plates arrayed upon a nonconductive substrate;

an insulating barrier separating said conductive plates, said insulating barrier extending above said conductive plates and terminating in a bulbous portion with edges extending over said conductive plates to define grooves for securing and aligning said conductive plates and to provide means for establishing said predetermined level;

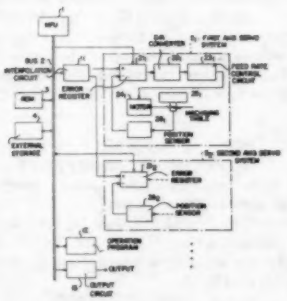
whereby, said moisture sensing means senses moisture whenever moisture collects on said conductive plates to a level sufficient to traverse said bulbous portion and electrically connect said conductive plates.

4,908,555

AXIS FEEDRATE OUTPUT SYSTEM

Yoshiaki Ikeda, Hachioji, and Mitsuru Kuwasawa, Kunitachi, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00045, § 371 Date Nov. 2, 1988, § 102(e) Date Nov. 2, 1988, PCT Pub. No. WO88/07229, PCT Pub. Date Sep. 22, 1988
PCT Filed Jan. 22, 1988, Ser. No. 273,517
Claims priority, application Japan, Mar. 19, 1987, 62-64798
Int. Cl.[4] G05B 19/18
U.S. Cl. 318—567 3 Claims



1. An axis feedrate output system for computer numerical control equipment which controls the position of a tool or machining table along a plurality of axes by effecting feedrate control in accordance with a residual error between a position command and detected position, comprising:

means for obtaining a current feedrate of the tool or machining table for each of the plurality of axes using the residual error;

means for obtaining a current actual feedrate of the tool or machining table based on said current feedrate for each of said axes; and

means for generating an output which represents said current actual feedrate of the tool or machining table as a ratio of said current actual feedrate to a predetermined maximum feedrate.

4,908,556

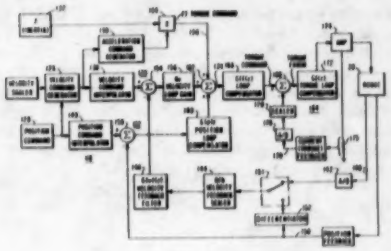
MODULAR ROBOT CONTROL SYSTEM

Kenneth E. Daggett, Murrysville, Pa.; Eimel M. Onaga, Brookfield Center, Conn.; Richard J. Casler, Jr., Newtown, Conn., and Barrett L. Booth, Brookfield, Conn., assignors to Unimation Inc., Danbury, Conn.

Filed Nov. 20, 1986, Ser. No. 932,983
Int. Cl.[4] G06F 9/02; B25J 13/00
U.S. Cl. 318—568.2 11 Claims

7. A modular robot control as set forth in claim 1 wherein said arm interface module is embodied on a first electronic board;

said torque processor module is embodied on a second electronic board; and



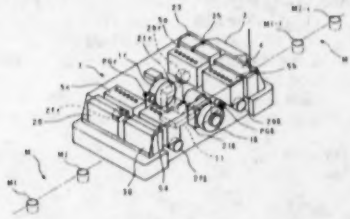
said position/velocity servo module is embodied on a third electronic board.

4,908,557

RUNNING CONTROL METHOD AND APPARATUS OF THE AUTOMATIC GUIDED VEHICLES

Masahiro Sudare, Osaka; Hisao Tomikawa, Takatsuki, and Mamoru Minami, Daito, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 17, 1988, Ser. No. 258,548
Claims priority, application Japan, Mar. 31, 1988, 63-80904
Int. Cl.[4] G05D *1/00*
U.S. Cl. 318—587 **5 Claims**



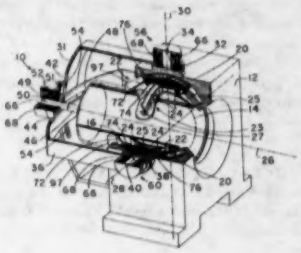
1. A running control method of an automatic guided vehicle which runs as detecting the running position and direction, characterized by detecting the magnetic field intensity of magnets arranged at fixed points on running courses, said detecting being conducted several times at a predetermined timing with a plurality of magnetic detecting elements aligned in a direction intersecting the moving direction of the vehicle, to calculate at least a first running position and direction of the automatic guided vehicle in response to detected outputs over a plurality of times of conducting said detecting of each of said plurality of magnetic detecting elements, wherein at least said calculated running position includes a position calculated in a first dimension substantially along said moving direction and a second dimension substantially along said direction intersecting the moving direction, and to correct said running positions and directions so as to follow said running courses according to the calculated values.

4,908,558

SPHERICAL MOTION SIMULATOR

Robert E. Lordo, Fort Mill, S.C., and Lloyd W. McSparran, Pittsburgh, Pa., assignors to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Apr. 22, 1988, Ser. No. 184,818
Int. Cl.[4] H02P *5/34*; H02K *1/06*
U.S. Cl. 318—648 **35 Claims**



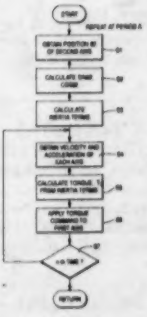
26. A linear induction motor comprising,
a stationary frame,
a conductive member supported for translational movement in two degrees of freedom on said stationary frame,
a stator element supported by said frame in spaced relation to one side of said conductive member,
a magnetic flux carrying element positioned adjadent to the opposite side of said conductive member,
a pair of polyphase current windings supported in orthogonal relationship on said stator element, and
a source of AC power supplied to said windings to generate a magnetic flux in said stator element and induce electrical current in said conductive member to produce a translational force acting in two degrees of freedom between said conductive member and said stationary frame.

4,908,559

ROBOT CONTROL APPARATUS

Mitsuo Kurakake, Hino; Keiji Sakamoto, and Takashi Iwamoto, both of Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP87/00450, § 371 Date Dec. 2, 1987, § 102(e) Date Dec. 2, 1987, PCT Pub. No. WO88/00369, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 30, 1987, Ser. No. 157,506
Claims priority, application Japan, Jun. 30, 1986, 61-153739
Int. Cl.[4] G05B *5/01*
U.S. Cl. 318—568.22 **7 Claims**



1. A robot control apparatus for computing, on-line, a torque command of a robot arm based on a motion equation of a

manipulator, and for servo-controlling each drive means, comprising:

a servomotor, coupled to the manipulator, for driving the manipulator through the intermediary of the robot arm;

arithmetic means for computing drive torque of the servomotor in accordance with the motion equation;

memory means for executing a computation, with regard to an inertia term included in the motion equation, at a predetermined period greater than a drive torque computation period in dependence upon the position of the robot arm, and for sequentially updating and storing the results of this computation; and

control means for applying the drive torque to the servomotor and performing feed-forward compensation of the servomotor based on the motion equation.

4,908,560

VEHICLE CORNERING LAMP SYSTEM

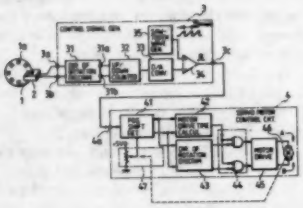
Hiroki Shibata; Kazuki Takahashi; Keiichi Tajima; Takashi Kurita; Kiyoshi Wada, and Kiyoshi Yamashita, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,448

Claims priority, application Japan, Sep. 8, 1987, 62-223067

Int. Cl.[4] B60Q *1/12*

U.S. Cl. 318—603 **3 Claims**



1. A vehicle cornering lamp system in which the direction of illumination of lamp means is changed in association with a steering-wheel turning operation, comprising:

control signal generating means for periodically generating a control signal having a pulse width corresponding to a steering angle;

position shift detecting means for detecting an amount of position shift between an actual direction of illumination of said lamp means and a target direction of illumination determined from said steering angle as indicated by said control signal provided by said control signal generating means;

an electric motor for setting said direction of illumination of said lamp means; and

direction-of-illumination changing means for driving said electric motor to change said direction of illumination of said lamp means so that said amount of position shift becomes zero.

4,908,561

SERVO AMPLIFIER CIRCUIT

Shuichi Hashimoto, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 9, 1989, Ser. No. 349,268

Claims priority, application Japan, May 13, 1988, 63-117628

Int. Cl.[4] G11B *21/08*

U.S. Cl. 318—677 **5 Claims**

1. A servo amplifier circuit comprising:

an output voltage detecting means for detecting an output voltage of said servo amplifier circuit;

a target value obtaining means for obtaining a target value of said servo amplifier circuit;

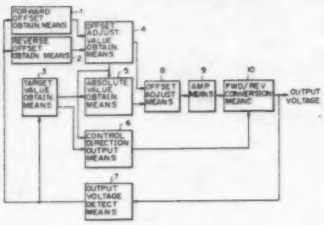
an absolute value outputting means for outputting an absolute value of said target value;

a control direction outputting means for outputting a sign of said target value;

an amplifier means for amplifying an output of said absolute value outputting means;

a forward/reverse conversion means for passing said output of said amplifier means with or without inverting said output in accordance with said sign of said target value;

a forward offset obtaining means for obtaining a forward offset which is defined as an output voltage of said servo amplifier without an adjustment when said absolute value is set to zero and said sign is set to plus;



a reverse offset obtaining means for obtaining a reverse offset which is defined as an output voltage of said servo amplifier circuit without an adjustment when said absolute vale is set to zero and said sign is set to minus;

an offset adjusting value obtaining means for obtaining an offset adjusting value using said forward offset and said reverse offset; and

an offset adjusting means for modifying the input of said amplifier means using said offset adjusting value, so that the difference between said forward offset and said reverse offset is reduced.

4,908,562

METHOD AND APPARATUS FOR CONTROLLING THE MAGNITUDE AND DIRECTION OF A CURRENT THROUGH A WINDING

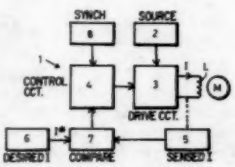
Per Ingvar M. Back, Lidingö , Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 21, 1988, Ser. No. 287,273

Claims priority, application Sweden, Dec. 21, 1987, 8705106

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **11 Claims**



1. A method of controlling the magnitude and direction of a current (I) through a winding (L), which winding is connected to an electrical energy source (2) via a drive circuit (3), this drive circuit having at least three types of operational state and can be controlled to change between different types of operational states, wherein the drive circuit in a first type of operational state can supply electrical energy to the winding from the energy source, wherein the drive circuit in a second type of operational state neither supplies any substantial electrical energy to the winding from the energy source nor feeds back

any substantial energy from the winding to the energy source, wherein the drive circuit in a third type of operational state does not supply any substantial electrical energy from the energy source but can feed back substantial electrical energy from the winding to the energy source, in which method the current through the winding is sensed and an actual value representing the sensed current is formed, and the actual value is compared with at least one desired value (I*) for the current, comprising the steps of:

when the drive circuit is in the first type of operational state, controlling the drive circuit such that it either maintains the first type of operational state or changes to the second type of operational state in response to the result of at least one comparison between the actual value and a desired value carried out during the time the drive circuit was in the first type of operational state;

when the drive circuit is in the third type of operational state, controlling the drive circuit such that it either maintains this state or changes to the second type of operational state in response to the result of at least one comparison between the actual value and a desired value carried out during the time the drive circuit was in the third type of operational state; and

when the drive circuit is in the second type of operational state, controlling the drive circuit, in appropriate cases, so that it changes to the first or the third type of operational state only after, and in response to, the result of at least one comparison between the actual value and a desired value carried out during the time the drive circuit was in the second type of operational state.

4,908,563

METHOD AND DEVICE FOR BRAKING A SQUIRREL-CAGE MOTOR

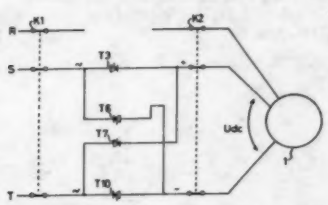
Seppo Suur-Askola, Awans, Belgium, assignor to Kone Elevator GmbH, Baar, Switzerland

Filed May 10, 1988, Ser. No. 192,791

Claims priority, application Finland, May 12, 1987, 872101

Int. Cl.[4] H02P 3/24

U.S. Cl. 318—760 **2 Claims**



1. A control method for braking a squirrel-cage motor (1) driven through a three-phase voltage converter said converter comprising:

(a) a thyristor circuit including one antiparallel thyristor pair (T1,T2) connected between a first phase terminal (R) of a three phase AC-power source and the motor (1);

(b) another thyristor circuit including two antiparallel thyristor pairs (T3,T4 and T5,T6) connected between the second phase terminal (S) of said three phase power source and the motor (1);

(c) a third thyristor circuit including two antiparallel thyristor pairs (T7,T8 and T9,T10) connected between a third phase terminal (T) of said three phase power source and the motor (1);

(d) seven firing circuits to fire said thyristors;

(e) a control circuit for feeding firing commands of said thyristors to said firing circuits;

said method comprising the steps of:

activating said firing commands of the thyristors (T1,T2,T3, T4,T9,T10 or T1,T2,T5,T6,T7,T8) depending on a driving direction;

selecting an operation mode of said converter between an ACdriving mode and a DC-braking mode,

selecting a DC braking sub-mode, when the DC braking mode is selected, from two sub-modes, a low torque DC braking sub-mode wherein thyristors T3 and T6 are fired so as to produce a pulsating direct current and thyristors T7 and T10 are fired so as to produce continuous direct current, and a high torque DC braking sub-mode wherein thyristors T3,T6,T7, and T10 all are fired so as to produce pulsating direct current, thereby enabling a fast transition back-and-forth between said AC driving mode and said DC braking mode.

4,908,564

DEVICE FOR SPEED CONTROL OF AN ASYNCHRONOUS MOTOR

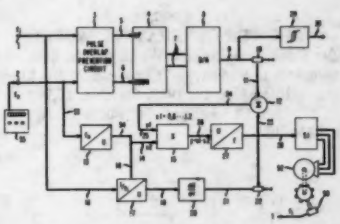
Erhard Lehle, Muehlheim am Main, Fed. Rep. of Germany, assignor to D.I.E.N.E.S. Apparatebau GmbH, Muehlheim am Main, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,433

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719463

Int. Cl.[4] H02P 5/40

U.S. Cl. 318—807 **45 Claims**



1. A device for digital speed control of an asynchronous motor fed via a static power converter comprising

a static power converter having an input and an output;

a motor connected to the output of the static power converter;

a rotation speed measurement device having an output and coupled with the motor and delivering a first pulse sequence, which first pulse sequence is proportional in its frequency to the actual rotation speed;

a digital up/down counter including a signal coincidence determining means having a first input connected to the output of the rotation speed measurement device, having a second input, and having an output, where the first pulse sequence delivered by the rotation-speed measurement device is fed to a first input of the digital up/down counter and where a second pulse sequence f_n, for setting the set-point rotation speed, is fed to the second input of the digital up/down counter, where a digital signal is provided at the output of the up/down counter in case of coinciding first input-pulse sequence and second input-pulse frequencies as determined by the signal coincidence determining means, which digital signal at the output of the up/down counter deviates from the mean value of a counter by an amount depending on the load while, during frequency deviation, a digital rotation-speed error signal occurs deviating upwardly or downwardly from this value of the up/down counter;

a digital to analog converter having an input connected to the output of the up/down counter and having an output, where the digital to analog converter follows the up/-down counter output;

a summator having a first input and a second input and an

output, where the output of the digital to analog converter is placed in connection with a first input of the summator and where a voltage, depending on the rotation-speed set-point value (f_n) and on the period duration ($1/f_i$) of the rotation-speed measurement-device output signal (f_i) fed to the second input of the summator;

a multiplier having a first input and an output, where an output of the summator is connected to the first input of a multiplier;

a frequency voltage converter having a first input, a second input and having an output, where a pulse sequence (f_n), corresponding to a set-point rotation speed, is fed to the first input of the frequency/voltage converter and where the output of the frequency/voltage converter is connected to the other input of the multiplier and the output of the frequency/voltage converter feeds a voltage, proportional to the set-point rotation speed (f_n), to the multiplier; a voltage/frequency converter having an input and having an output, where the output of the multiplier is connected to the input of the voltage/frequency converter and where the output of the voltage/frequency converter is connected to the input of the static power converter and where the output signal of the digital to analog converter delivers the digital control signal for the converter static power converter after comparison with a voltage proportional to a set-point rotation speed via the voltage/frequency converter.

4,908,565

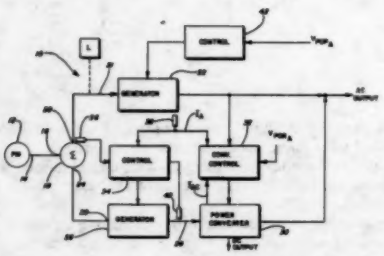
POWER GENERATING SYSTEM

Alexander Cook, and Richard W. Reynolds, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 18, 1987, Ser. No. 15,903

Int. Cl.[4] H02P 9/00; F02N 11/08

U.S. Cl. 322—10 **64 Claims**



1. A power supply system for developing electrical power at a system output from variable-speed motive power produced by a prime mover, comprising:

a differential speed summer having a first shaft coupled to the prime mover and further having second and third shafts;

a first generator coupled to the second shaft of the differential;

a second generator coupled to the third shaft of the differential;

a power conditioner for conditioning the total output power of the second generator; and

means for regulating a parameter of the conditioned total output power of the second generator to cause the motive power shaft of the first generator to rotate at a constant speed so that such generator develops constant-frequency AC output power at the system output;

wherein the power conditioner comprises an inverter and the regulating means includes means for controlling the inverter so that it produces output power at a desired output frequency and wherein the inverter is coupled to the first generator output so that the first generator develops output power at a frequency equal to the inverter output frequency.

48. A method of bringing a power supply system up to a condition of regulated output frequency once a prime mover which provides motive power to the system is within a speed operating range wherein the power supply includes a differential having first through third shafts coupled to the prime mover and to motive power shafts of first and second generators, respectively, and a power converter coupled between electrical power outputs of the first and second generators whereby the outputs of the first generator and the power converter are combined to develop AC output power at a system output, comprising the steps of:

(a) applying a source of input power to the power converter;

(b) operating the power converter to provide power to the first generator to operate it as a motor to thereby force the motive power shaft thereof to rotate at a particular speed; and

(c) thereafter controlling the frequency of the power converter output to maintain the speed of the first generator motive power shaft constant so that the first generator and power converter together develop constant-frequency AC power.

4,908,566

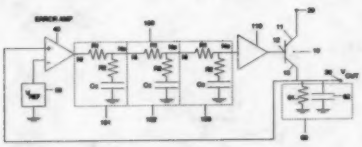
VOLTAGE REGULATOR HAVING STAGGERED POLE-ZERO COMPENSATION NETWORK

Bruce J. Tesch, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 22, 1989, Ser. No. 313,435

Int. Cl.[4] G05F 1/56

U.S. Cl. 323—280 **16 Claims**



1. A voltage regulator circuit comprising:

an output amplifier stage having an input terminal to which an unregulated input voltage is coupled, an output terminal from which a regulated output voltage is derived, and a control terminal to which a control voltage is applied;

an error amplifier stage having a first input coupled to said output terminal, a second input coupled to receive a reference voltage, and an output from which an error voltage representative of the difference between said regulated output voltage and said voltage is coupled as said control voltage for said output amplifier stage; and

means, coupled in a feedback path from said output terminal through said error amplifier stage to said control terminal, for maintaining the open loop phase differential between the first input of said error amplifier stage and the output terminal of said output amplifier stage less than 360° for the entirety of the frequency range over which the gain is equal to or greater than unity.

4,908,567

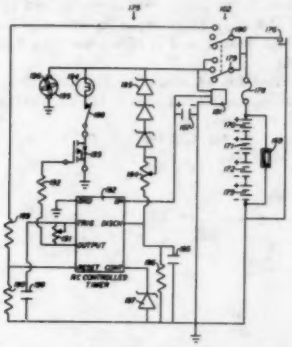
POWER SUPPLY SYSTEM FOR AN OPTICAL INSPECTION APPARATUS

Robert H. Welker, Sugar Land, and Ken Smith, Houston, both of Tex., assignors to Welker Engineering Company, Sugar Land, Tex.

Division of Ser. No. 212,274, Jun. 27, 1988, Pat. No. 4,339,324, which is a division of Ser. No. 897,195, Aug. 15, 1986, Pat. No. 4,777,567. This application Feb. 21, 1989, Ser. No. 312,935

Int. Cl.[4] G05F 5/00

U.S. Cl. 323—299 2 Claims



1. For use in a stabilized light supply system subject to battery voltage variation, power supply system comprising:

(a) a battery having an output voltage subject to variation over a period of time;

(b) a voltage tracking circuit connected to said battery for following variations in battery voltage, said tracking circuit having an output terminal providing a signal indicative of battery voltage variations; and voltage tracking circuit comprising a RC charging circuit serially with a Zener diode, said RC circuit charging more rapidly with increased battery voltage, and also including means for controllably discharging said RC circuit periodically;

(c) timing circuit means connected to said voltage tracking circuit terminal, said timing circuit means forming a timed duty cycle control signal having a duty cycle varied with battery voltage variations, said timing circuit means having a voltage dependent input connected thereto from said voltage tracking circuit means;

(d) electronic switch means having a control input connected to said timing circuit means for control by the control signal therefrom; and

(e) a lamp serially connected to said battery to be powered thereby, said lamp also being connected with said electronic switch means to control current flow from said battery through said lamp and further subject to control by the timed duty cycle control signal for adjusting current flow to thereby adjust light output notwithstanding battery voltage variations.

4,908,568

MECHANICAL PROBE FOR OPTICAL MEASUREMENT OF ELECTRICAL POTENTIALS

Soelkner Gerald, Linz, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

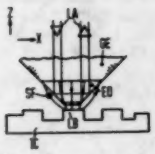
Filed Apr. 28, 1988, Ser. No. 187,332

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1987, 3719204

Int. Cl.[4] G01R 19/00, 31/00; G02F 1/09

U.S. Cl. 324—96 8 Claims

1. A mechanical probe for optical measurement of electrical potentials and having an electro-optical crystal which is located immediately above a subject surface and which is penetrated by a light ray, comprising a cubic crystal fashioned in



the form of a tip having an electrode located on a surface thereof in the region of the tip.

4,908,569

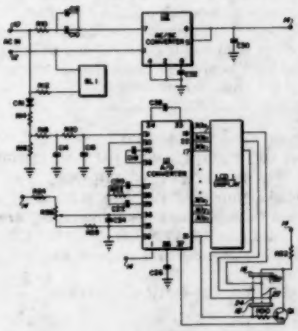
TRANSFORMERLESS LINE POWDERED DIGITAL AC VOLTMETER

Otto P. Fest, 4016 E. Tennessee St., Tucson, Ariz. 85714

Filed Aug. 9, 1988, Ser. No. 230,044

Int. Cl.[4] G01R 19/22

U.S. Cl. 324—120 7 Claims



1. A transformerless line powered digital AC voltmeter for measuring AC voltage on an electrical line obviating the need for a separate internal electrical battery or external source of electrical power for the voltmeter operative electrical power comprising:

means operably connected to the electrical line to receive the AC voltage to be measured, said means converting the AC voltage to digital electrical signals for a digital output indicative of the AC voltage input, said AC voltage converting means including a half wave rectifier and voltage divider circuit to convert the AC voltage to half wave DC voltage and reduce its magnitude, DC voltage modification means operably receiving the reduced half wave DC voltage, and an A/D converter connected to said DC voltage modification means;

means operatively connected to said A/D converter to receive said digital electrical signals and visually display them in a readable form; and

means operably connected to the electrical line being measured and to said AC voltage converter means providing a source of operative DC electrical power to said AC voltage converter means, said means including an AC/DC converter and circuit means to assure that a minimum AC electrical voltage input to said AC/DC converter is provided, said circuit means assuring minimum AC voltage input defining a series resistor-capacitor circuit interposed the electrical line measured and said AC/DC converter.

4,908,570

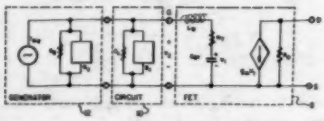
METHOD OF MEASURING FET NOISE PARAMETERS

Madhu S. Gupta, Oakpark, Ill.; Paul T. Greiling, Thousand Oaks; Steven E. Rosenbaum, Canoga Park, Calif., and Octavius Pitzalis, Malibu, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 1, 1987, Ser. No. 56,848

Int. Cl.[4] G01R *29/26, 31/00*

U.S. Cl. 324—158 T 27 Claims



1. A method of determining a noise parameter of a field effect transistor (FET) formed on a single wafer with a plurality of other FETs, comprising:

determining at least some of the FETs equivalent circuit parameters consisting of the input gate-to-source capacitance (C_{gs}), input resistance (R_I), transconductance (g_m) and output resistance R_o) while the FET is in a wafer state, and

measuring the output power (P_n) of the FETs intrinsic noise with a receiver, determining the power spectral density (S_{io}) of the FETs intrinsic noise current independent of the receiver used to measure P_n, and utilizing S_{io} along with said FET equivalent circuit parameters in the calculation of the noise parameter.

4,908,571

CONTACT PROBE ASSEMBLY WITH FINE POSITIONING MEANS

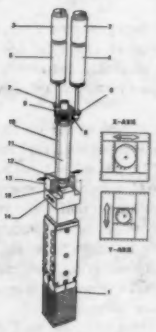
Roland R. Stoehr, Nufringen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1988, Ser. No. 183,552

Claims priority, application European Pat. Off., May 26, 1987, 87107669.1

Int. Cl.[4] G01R *1/06, 31/02*

U.S. Cl. 324—158 P 5 Claims



1. In a system for the testing of the electrical characteristics of semiconductor devices wherein a contact probe assembly with a head comprising a maxtrix of test probe leads of millimeter diameter, electrically conductive wires which are arranged to contact the connector pads on said semiconductor device, the improvement to said contact probe assembly comprising: (a) a fine positioning means for aligning said wires to within a range of +/− 2 wire diameters to said pads, said positioning means having a motor-driven means which permits moving the contact probe assembly in two directions which are perpendicular to each other with the longitudinal axis of the positioning means being perpendicular to the plane defined by the two directions of movement with said fine positioning in the two directions which are perpendicular to each other being effected by a hollow shaft with a lower eccentrically shaped end such that upon rotation of said shaft, a follower slide, permanently connected to the contact probe assembly, is reciprocally moved, transferring its movement thereto.

4,908,572

ROTATIONAL SPEED SENSOR WITH UNFIXED AND/OR FIXED EDGE SPEED CALCULATION MODES

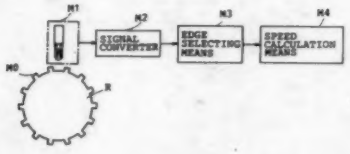
Kazunori Sakai, Aichi; Shinji Wakabayashi, and Hiromi Machata, both of Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippondenso Co., Ltd., both of Aichi, Japan

Filed Jul. 18, 1988, Ser. No. 220,625

Claims priority, application Japan, Jul. 22, 1987, 62-182470; Jun. 17, 1988, 63-150433

Int. Cl.[4] G01P *3/48*

U.S. Cl. 324—173 6 Claims



1. A speed sensor for a rotating body comprising:

a plurality of teeth attached around the rotating body, the teeth being made of magnetic material;

a magnetic pick-up element provided separately from the rotating body for generating an electrical signal responsive to passing of any of the plurality of teeth;

a signal converter for converting the electrical signal into pulses;

edge selecting means for selecting either a rising edge or a falling edge of the pulses for every pulse monitoring period depending on a relative phase position of the pulses and the pulse monitoring period; and

speed calculation means for calculating the speed of the rotating body by measuring a cycle time of the selected edge of the pulses corresponding to the pulse monitoring period,

wherein any one of the rising edge and the falling edge that occurs just before the pulse monitoring period starts is selected by the edge selecting means.

4,908,573

3D IMAGE RECONSTRUCTION METHOD FOR PLACING 3D STRUCTURE WITHIN COMMON OBLIQUE OR CONTOURED SLICE-VOLUME WITHOUT LOSS OF VOLUME RESOLUTION

Leon Kaufman, San Francisco; David M. Kramer, San Rafel, and Ricardo Guzman, San Francisco, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 5, 1989, Ser. No. 293,859

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 20 Claims

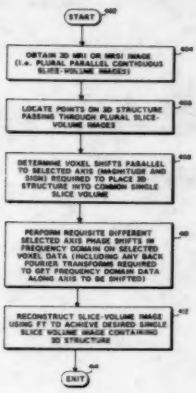
1. A three-dimensional image processing method for reconstructing the image of a structure passing through plural slice-volumes of a three-dimensional image into a common single contour-volume so that a greater portion of the structure can be viewed simultaneously in a single planar image of a single contour-volume, said method comprising the steps of:

(a) determining, in the spatial domain within said three-dimensional image, varying voxel shifts along rays parallel to a predetermined axis required to place a selected imaged structure within a common image contour-volume,

where the selected structure initially passes to varying extents within plural slice-volumes of the three-dimensional image;

(b) performing corresponding requisite variable phase-shifts on frequency domain data representing said three-dimensional image voxels along rays parallel to said predetermined axis, said phase shifts varying from one voxel to another as required by the varying extent to which said structure passes within the slice-volumes of the original image; and

(c) transforming the thus variably phase-shifted frequency domain data to produce a new three-dimensional image having an increased portion of the structure within a single contour-volume thereof.


START
OBTAIN 3D NMR OR NMRI IMAGE (i.e. PLURAL PARALLEL CONTIGUOUS SLICE-VOLUME IMAGES)
LOCATE POINTS ON 3D STRUCTURE PASSING THROUGH PLURAL SLICE-VOLUME IMAGES
DETERMINE VOXEL SHIFTS PARALLEL TO SELECTED AXIS (MAGNITUDE AND SIGN) REQUIRED TO PLACE 3D STRUCTURE INTO COMMON SINGLE SLICE VOLUME
PERFORM REQUISITE DIFFERENT SELECTED AXIS PHASE SHIFTS IN FREQUENCY DOMAIN ON SELECTED VOXEL DATA (INCLUDING ANY BACK FOURIER TRANSFORMS REQUIRED TO GET FREQUENCY DOMAIN DATA ALONG AXIS TO BE SHIFTED)
RECONSTRUCT SLICE-VOLUME IMAGE USING FT TO ACHIEVE DESIRED SINGLE SLICE VOLUME IMAGE CONTAINING 3D STRUCTURE
END

4,908,574

CAPACITOR ARRAY SENSORS FOR DETERMINING CONFORMITY TO SURFACE SHAPE

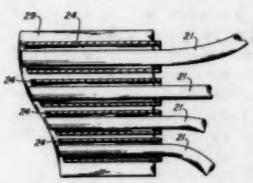
Lawrence J. Rhoades, Pittsburg; Donald Risko, Monroeville, and Ralph L. Resnick, Slickville, all of Pa., assignors to Extrude Hone Corporation, Irwin, Pa.

Continuation-in-part of Ser. No. 903,178, Sep. 3, 1986, Pat. No. 4,766,389. This application Jul. 29, 1988, Ser. No. 225,820

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[4] G01B *7/28, 7/34*

U.S. Cl. 324—675 **12 Claims**



1. A capacitance sensor array for sensing and quantifying conformity of a workpiece surface contour to design requirements comprising a plurality of capacitor elements formed in a three-dimensional array of contour topology conforming to the topology of the design requirements of said workpiece, means for actively connecting each of said capacitor elements and said workpiece to one of a plurality of corresponding oscillator circuits while said capacitor elements are closely spaced from said workpiece so that the oscillation frequency of each of said circuits is a function of the capacitance between each said capacitor element and said workpiece, and means for generating an output from said sensor which is a function of the conformity of the contour topology of said workpiece to the contour topology of said array of capacitor elements determined by response of the said plurality of oscillator circuits.

4,908,575

CIRCUIT FOR MEASURING DIFFUSION-LIMITED CURRENT

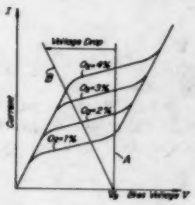
Jun Usami, Aichi, and Yuichi Sasaki, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jul. 15, 1987, Ser. No. 73,969

Claims priority, application Japan, Jul. 15, 1986, 61-166266

Int. Cl.[4] G01N *27/04*

U.S. Cl. 324—711 **4 Claims**



1. In a circuit for measuring a gas concentration with the aid of a diffusion-limited current element having first and second electrodes, through said element, a diffusion-limited current flowing in proportion to the gas concentration including an output resistor connected in series with the diffusion-limited current element for converting the diffusion-limited current into an output signal and a bias voltage source for applying a bias voltage across a series circuit of the diffusion-limited current element and the output resistor, said bias voltage source comprising:

a reference voltage generator for generating a constant reference voltage at an output;

a differential amplifier having positive and negative inputs and an output, said output of the differential amplifier being connected to one end of said output resistor;

first conductor means connected between the other electrode of the diffusion-limited current element and the ground potential;

second conductor means connected between the positive input of the differential amplifier and the ground potential;

a first resistor connected between the output of said reference voltage generator and the negative input of the reference voltage generator; and

a second resistor connected between a junction point between the other electrode of the diffusion-limited current element and the output resistor and the negative input of the differential amplifier, whereby the bias voltage applied across the diffusionlimited current element is kept constant.

4,908,576

SYSTEM FOR PRINTED CIRCUIT BOARD TESTING

Daniel K. Jackson, 13580 SW. A Goodall Rd., Lake Oswego, Oreg. 97034

Filed Sep. 8, 1987, Ser. No. 94,407

Int. Cl.[4] G01R *31/28;* **G06F** *11/00*

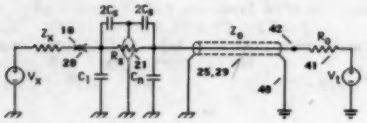
U.S. Cl. 371—22.3 **64 Claims**

57. A system for testing printed circuit boards having a first plurality of test nodes, comprising:

a test fixture having a second plurality of test probes for sensing electrical test signals at said test nodes;

a test instrument having a third plurality of inputs for simultaneously receiving a number of said test signals and analyzing same;

multiplexing means coupled between the test fixture and the test instrument for selecting among a number of alternative test signal paths for transmitting said test signals from the test probes to the test instrument inputs and reducing the number of test signals from said second plurality down to a reduced number not exceeding said third plurality of test instrument inputs;



adjustable delay means in each signal path for imparting automatically, under algorithmic control, a predetermined relative delay to the test signals; and

delay determining means for determining automatically, under algorithmic control, the delay in each signal path.

4,908,577

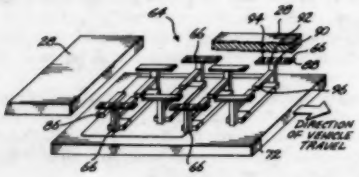
SYSTEM FOR MONITORING THE GAP BETWEEN, AND RELATIVE POSITION OF, RELATIVELY MOVABLE ELEMENTS

William N. Byers, Seattle, and Richard G. Gilliland, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 11, 1988, Ser. No. 217,627

Int. Cl.[4] G01B *7/14*; **G01N** *27/72*; **G01R** *33/00*; **B60L** *13/06*

U.S. Cl. 324—207.20 **11 Claims**



1. A sensor for use in monitoring the gap between, and relative position of, first and second elements that are movable relative to each other, the first element defining a path of relative motion that includes consecutive regions whose magnetic permeabilities are alternately at first and second levels, said sensor comprising:

a sensor element, securable to the second element, for producing data having a magnitude that varies in part with the magnetic permeability of the region of the first element adjacent said sensor element as the first and second elements undergo relative motion; and

processing means for monitoring said data and producing an output indicative of the gap, based upon information obtained from said data produced when the region adjacent said sensor element has a magnetic permeability equivalent to the first level, and an output indicative of relative position, based upon information obtained from said data produced when consecutive ones of the regions are adjacent said sensor element.

4,908,578

METHOD OF AND DEVICE FOR GENERATING INTERLEAVED MULTIPLE-SLICE MULTIPLE-ECHO PULSE SEQUENCES FOR MRI

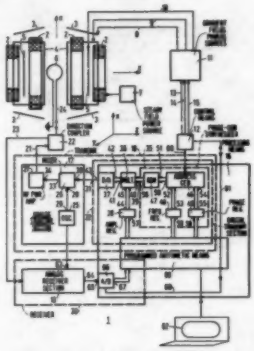
Filips Van Liere, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1988, Ser. No. 290,075

Claims priority, application Netherlands, Dec. 24, 1987, 8703127

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **16 Claims**



1. A method of determining a nuclear magnetization distribution from magnetic resonance signals which are generated in plural three-dimensional sub-regions in a body by the application, in the presence of a steady, uniform magnetic field, of cycles of respective plural sub-region-selective sequences of RF electromagnetic field pulses and magnetic field gradient waveforms, in three mutually orthogonal directions, superimposed on said steady, uniform magnetic field, which respective plural sub-region-selective sequences are all applied in each cycle, each sub-region-selective sequence comprising an RF excitation pulse in the presence of a selection gradient waveform associated with said sequence, for selection in a first direction, followed by a phase encoding gradient waveform, which is varied in amplitude, in a second and/or a third direction, from one cycle to the next for phase encoding, followed by one or more RF echo pulses which generate respective one or more echo resonance signals, wherein first and second of said plural sub-region-selective sequences are interleaved in time with each other in that the RF excitation pulse of the second sub-region-selective sequence occurs in the time interval between the RF excitation pulse and the last of said one or more echo resonance signals generated in the first sub-region-selective sequence and wherein within each sub-region-selective sequence said RF excitation pulse and said one or more RF echo pulses are phase coherent with each other.

4,908,579

SWITCHED CAPACITOR SAMPLING FILTER

Mohamed S. Tawfik, and Patrice Senn, both of Grenoble, France, assignors to Etat Francais, represente par le Ministre Delegue des Postes et Telecommunications, (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux, France

Filed Aug. 24, 1988, Ser. No. 235,495

Claims priority, application France, Aug. 26, 1987, 8711961

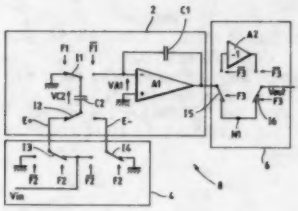
Int. Cl.[4] H03K *5/00*; **H03B** *1/00*

U.S. Cl. 328—167 **9 Claims**

1. A circuit of the type comprising at least one basic cell arranged as a switched capacitor low pass sampling filter, together with a clock suitable for defining two different states

for controlling sampling, wherein the circuit further comprises:

upstream switching means suitable for inverting the polarity of an input signal to the cell during one of the two states; and



downstream switching means suitable for inverting an output signal from the cell, thereby making it possible to transpose the filtering frequency band of the cell from low-pass to high pass.

4,908,580

VACUUM CHAMBER FOR AN SOR APPARATUS

Tadatoshi Yamada; Masatami Iwamoto; Akinori Ohara; Shirou Nakamura, all of Amagasaki, and Yuuichi Yamamoto, Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

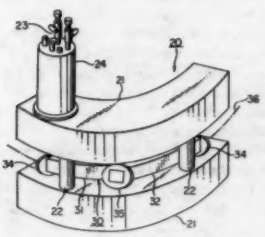
Continuation of Ser. No. 43,320, Apr. 28, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,162

Claims priority, application Japan, May 1, 1986, 61-99362

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.[4] H05H *13/04*

U.S. Cl. 328—235 **2 Claims**



1. A vacuum chamber for an SOR apparatus of the type having a superconducting bending magnet having two confronting superconducting coils, each of which is housed in a separate vacuum container, said vacuum containers having a gap therebetween and being connected with one another by a plurality of support members which extend across said gap and resist the attractive forces acting on said superconducting coils during the operation of said housing magnet, said vacuum chamber comprising:

a main chamber through which a beam of charged particles can pass, said main chamber having a connecting flange formed on each end thereof; and

an SOR chamber for synchrotron orbital radiation, the inner end of said SOR chamber opening onto the inside of said main chamber and the outer end of said SOR chamber having a connecting flange formed thereon, said SOR chamber being positioned such that SOR which is emitted by a beam passing through said main chamber can pass through said SOR chamber, wherein said connecting flanges of said main chamber and said connecting flange of said SOR chamber all lie within said gap between said two separate vacuum containers and the diameter of each of said flanges is less than the distance between adjacent of said support members.

4,908,581

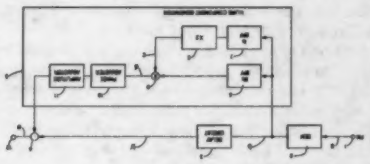
FREQUENCY DEMODULATOR HAVING CIRCUIT CANCELLING UNDESIRED SIGNAL COMPONENTS

Masahiro Honjo, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 21, 1988, Ser. No. 222,169

Int. Cl.[4] H04N *5/21, 9/87*

U.S. Cl. 329—320 **17 Claims**



1. A frequency demodulation apparatus for demodulating a frequency-modulated signal obtained by modulating a carrier frequency f_c with a signal frequency f_s, comprising:

a demodulating means for demodulating the frequency-modulated signal to obtain a demodulated signal which contains an m-times-multiplied carrier frequency mf_c, where m is a natural number, the signal frequency f_s and an nth-order lower sideband component $mf_c - nf_s$ as an undesired moire component, where n is a natural number;

a moire component generating means for extracting the carrier frequency mf_c and the signal frequency f_s from the demodulated signal and for generating a moire component $mf_c - nf_s$ corresponding to said undesired moire component; and

a subtracting means for subtracting the moire component generated by said moire component generating means from said demodulated signal so as to thereby obtain a demodulated signal from which said undesired moire component is eliminated.

4,908,582

AFC CIRCUIT FOR PRODUCING A RIPPLE-FREE OSCILLATOR CONTROL VOLTAGE

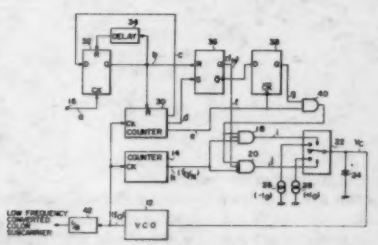
Mitsumo Kawano, Kumagaya, and Tadashi Terada, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1989, Ser. No. 330,292

Claims priority, application Japan, Mar. 31, 1988, 63-78764

Int. Cl.[4] H03L *7/08*

U.S. Cl. 331—1 A **20 Claims**



1. An automatic frequency control (AFC) circuit comprising:

input terminal means for receiving a reference pulse signal recurring at predetermined cycles;

voltage controlled oscillating means for outputting an oscillating output pulse signal;

frequency demultiplying means for demultiplying a frequency of the oscillating output pulse signal, output from said voltage controlled oscillating means, to produce a first pulse signal of the same period as that of said reference pulse signal received at said input terminal means;

pulse generating means for counting said oscillating output pulse signal from said voltage controlled oscillating means in synchronism with said reference pulse signal, to output thereby a second pulse signal of substantially the same pulse width as that of said first pulse signal, output from said frequency demultiplying means;

first multiplying means for multiplying said first and second pulse signals during a predetermined period in synchronism with said reference pulse signal, to produce thereby a third pulse signal of a pulse width based on a phase difference between said first and second pulse signals, only when said first pulse signal advance in phase with respect to said second pulse signal;

second multiplying means for multiplying said first and second pulse signals during said predetermined period in synchronism with said reference pulse signal, to produce thereby a fourth pulse signal of a pulse width based on a phase difference between said first and second pulse signals, only when said first pulse signal lags in phase with respect to said second pulse signal; and

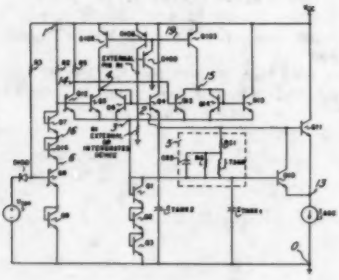
frequency control means for generating a control voltage based on the pulse width of either of said third and fourth pulses, and supplying said control voltage to said voltage controlled oscillating means, to control thereby an oscillating frequency of said voltage controlled oscillating means so as to phase lock said oscillating output pulse signal with said reference pulse signal.

4,908,583

ZERO PHASE STARTUP FOR A TANK TYPE VOLTAGE CONTROLLED OSCILLATOR

Michael H. Haight, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 11, 1988, Ser. No. 217,504
Int. Cl.[4] H03B *5/12*; H03L *3/00*
U.S. Cl. 331—117 R **16 Claims**



1. An oscillator system comprising:

(a) a tank type oscillator having a coil and a capacitor;

(b) means to control the current in said coil comprising:

first means coupled to one end of said coil to provide a substantially constant normal DC current through said coil providing a substantially constant normal DC voltage at said end of said coil;

second means coupled to the other end of said coil to provide a substantially constant normal DC voltage at said other end of said coil; and

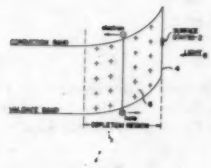
means responsive to a predetermined condition to reciprocatingly operate said first and second means.

4,908,584

SPATIAL LIGHT MODULATOR USING SURFACE STATE PHOTODIODES

Joseph Reichman, Roslyn Estates, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 7, 1988, Ser. No. 203,372
Int. Cl.[4] G02F *1/13*; H01J *31/50*
U.S. Cl. 330—4.3 **10 Claims**



1. A spatial light modulator, comprising:

first and second parallel glass plates;

corresponding transparent electrically conductive layers formed on the inner opposed surfaces of the glass plates;

an electro-optic layer interposed spatially between the electrically conductive layers;

a surface state photodiode layer positioned between the electro-optic layer and one of the electrically conductive layers, a high dark impedance region whereat substantially all electrons are removed being effected proximate to the surface of the photodiode layer facing the electro-optic layer by adsorption of nonindigenous atoms or molecules as surface states on the surface of the photodiode layer facing the electro-optic layer;

wherein, when a read light and an imaging light are incident onto the surface state photodiode layer and a voltage is applied to the electrically conductive layers, an optical image of an object focused onto the spatial light modulator by the imaging light is outputted from the spatial light modulator by the read light, the intensity of the outputted read light being proportional to the amount of imaging light incident onto the surface state photodiode layer.

4,908,585

RF TRANSFORMER AND DIAGNOSTIC TECHNIQUE THEREFOR

Peter P. Chenausky, 151 Deercliff Rd., Avon, Conn. 06001

Continuation of Ser. No. 171,629, Mar. 22, 1988, said Ser. No. 171,679, is a continuation-in-part of Ser. No. 728,744, Apr. 30, 1985, Pat. No. 4,751,717. This application Feb. 27, 1989, Ser. No. 316,022
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—24 R **18 Claims**

1. A gas laser having an RF transformer, said transformer comprising:

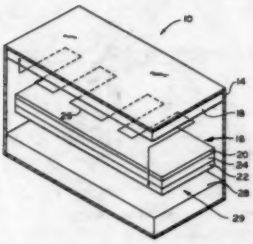
first conductor means, said first conductor means having an axially extending electrically conductive surface portion and being electrically grounded;

second conductor means, said second conductor means having an axially extending electrically conductive surface portion;

third conductor means, said third conductor means having a electrically conductive surface portion, said third conduc-

tor means surface portion being spatially displaced from said first conductor means surface portion, said first and third conductor means surface portions cooperating to define therebetween an interior capacitance C_X, said third conductor means also at least in part defining an exterior capacitance C_L;

means supporting said second conductor means such that the surface portion thereof is intermediate the surface portions of said first and third conductor means whereby said second conductor means divides said capacitance C_X into a pair of capacitances C_A and C_B;



fourth conductor means for defining an axially extending space within said exterior capacitance C_L between said third and fourth conductor means wherein the laser gas is disposed;

at least one of said third conductor means and said fourth conductor means comprising a plurality of axially spaced, transversely extending plates;

at least a first inductive element connected between a pair of said conductor means; and

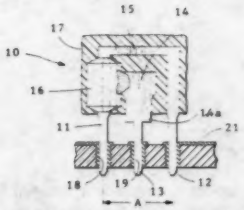
means for applying an RF voltage between said first and second conductor means, the frequency of said RF voltage being chosen to coincide with a minimum voltage standing wave ratio of the transformer input impedance.

4,908,586

COMPACT ENCAPSULATED FILTER ASSEMBLY FOR PRINTED CIRCUIT BOARDS AND METHOD OF MANUFACTURE THEREOF

John P. Kling, Mt. Joy, and Richard F. Stone Jr., Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 30, 1987, Ser. No. 103,094
Int. Cl.[4] H03H *7/01*
U.S. Cl. 333—182 **12 Claims**



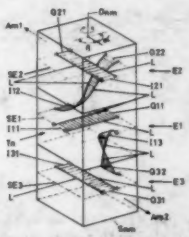
1. A filter assembly of the type having a single filter sleeve for providing RFI/EMI filtering on a printed circuit board, comprising three legs disposed substantially parallel to each other and including a first outer leg, a second outer leg, the first and second outer legs being joined by a bight portion, and a central leg disposed between the first and second outer legs, wherein the outer legs comprise the respective conductors of the filter assembly, and wherein the central leg comprises a ground pin of the filter assembly; a substantially cylindrical filter sleeve received over and mechanically secured and electrically engaged with one of the outer legs, such that the filter sleeve is disposed substantially parallel to the legs of the filter assembly and has an outer side surface closely adjacent a side surface of said central leg, said outer side surface being electrically engaged with said central leg by means of conductive joining material, and insulating material encapsulating the filter sleeve, bight portion and respective portions of the legs, whereby the spacing between the outer and central leg is minimized and the filter assembly is substantially compact.

4,908,587

ANTENNA SELECTOR

Stojan Davcev, Skopje, Yugoslavia, assignor to ASEA Brown Boveri Ltd., Baden, Switzerland

Filed Jan. 26, 1989, Ser. No. 301,829
Claims priority, application Switzerland, Jan. 26, 1988, 261/88
Int. Cl.[4] H01P *1/10*
U.S. Cl. 333—101 **7 Claims**



1. An antenna selector in the form of a switching matrix for the optional connection of a plurality of transmitters to a plurality of antennae, in which antenna selector

(a) on a first level (E1) a plurality of first feeder lines (F11, . . . , F13) are arranged parallel to one another, one transmitter connection (T1, . . . , T4) being associated with each of the first feeder lines (F11, ..., F13);

(b) on a second level (E2) parallel to the first level (E1) a plurality of second feeder lines (F21, ... , F24), are arranged parallel to one another and at right angles to the first feeder lines (F11, . . . , F13), one first antenna connection (A11, . . . , A81, Am1) being associated with each of the second feeder lines (F21, ..., F24); and

(c) there is provided at the intersections of the first and second feeder lines (F11, ..., F13 and F21, ..., F24 respectively) in each case a switch (S11, ..., S34) which has a corresponding switching level (SE1, SE2) on each of the levels (E1, E2), and which in a first switching position connects through the associated first feeder line on the first level (E1) and the associated second feeder line on the second level (E2), and in a second switching position interrupts the associated first and second feeder line on the respective level and mutually connects them from one level to the other; wherein

(e) there is arranged on a third level (E3) parallel to the first two levels (E1, E2) a plurality of third feeder lines (F31, ..., F34) parallel to one another and at right angles to the first feeder lines (F11, . . ., F13), a second antenna connection (A12, . . ., A82, Am2) being associated with each of the third feeder lines (F31, . . ., F34);

(f) the intersections of the first and third feeder lines (F11, . . ., F13 and F31, . . ., F34 respectively) coincide with corresponding intersections of the first and second feeder lines (F11, . . ., F13 and F21, ..., F24 respectively); and

(g) each switch has a switching level (SE3) corresponding to the third level (E3), and in the first switching position also

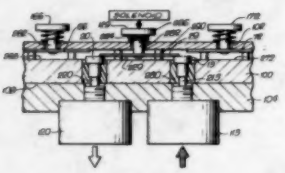
connects through the associated third feeder line on the third level (E3), in the second switching position also interrupts the associated third feeder line on the third level (E3), and in a third switching position interrupts all three associated feeder lines on their respective levels and only mutually connects the associated first and third feeder lines from one level to the other.

4,908,588

MATRIX SWITCH

Jerzy Hoffman, Marina del Ray, and Krzysztof J. Ciezarek, Sherman Oaks, both of Calif., assignors to Hu Development Corporation, Santa Monica, Calif.

Filed Jun. 2, 1988, Ser. No. 202,049
Int. Cl.[4] H01P *1/10, 5/12;* H01H *63/00*
U.S. Cl. 333—105 **12 Claims**



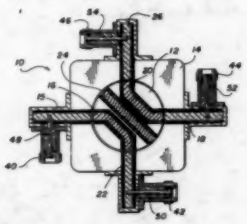
1. An input/output RF matrix switch comprising:
a solid body provided with a plurality of apertures extending through the body;
a plurality of terminals externally disposed on one side of the body;
a plurality of probe conductors, each probe conductor received in an aperture and extending through the body, each probe conductor carrying one of the plurality of terminals;
a plurality of actuable conductors, each conductor being disposed on a side of the body and being movable between an actuated position wherein each actuable conductor engages and electrically couples two terminals together, and an unactuated position;
a plurality of input/output connectors disposed on a side of the body, each connector being electrically coupled to a probe conductor terminal; and
a plurality of conductor lines disposed on a side of the body, each conductor line electrically coupling at least two probe conductors together;
wherein at least two connectors are selectively electrically couplable to each other via the probe conductors associated with the two connectors and the actuable conductor associated with the terminals of the two probe conductors and by moving the associated actuable conductor to the actuated position to engage and electrically couple the terminals of the two probe conductors associated with the two connectors, and wherein at least two other connectors are selectively electrically couplable together via a first probe conductor, a second probe conductor, a first actuable conductor associated with the terminals of the first and second probe conductors, a third probe conductor, a fourth probe conductor, a second actuable conductor associated with the terminals of the third and fourth probe conductors, and a conductor line electrically coupling the second and third probe conductors together and by moving the first and second actuable conductors to their actuated positions.

4,908,589

DIELECTRICALLY LOADED WAVEGUIDE SWITCH

Richard V. Basil, Jr., Chatsworth, and Juri G. Leetmaa, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 21, 1987, Ser. No. 99,401
Int. Cl.[4] H01P *1/10, 5/12*
U.S. Cl. 333—106 **12 Claims**



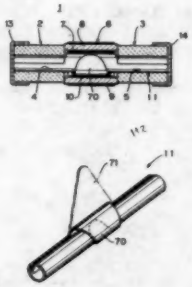
1. A waveguide switch comprising:
a first waveguide having a solid dielectric material therein;
a second waveguide having a solid dielectric material therein; and
switch means for connecting said first waveguide to said second waveguide.

4,908,590

CHIP-LIKE LC FILTER

Yukio Sakamoto; Shinichi Madokoro, and Shingo Okuyama, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 1,702, Jan. 9, 1987, Pat. No. 4,801,904. This application Apr. 15, 1988, Ser. No. 182,105
Claims priority, application Japan, Jan. 14, 1986, 61-3537[U]; Jan. 29, 1986, 61-12375[U]; Jun. 27, 1986, 61-99405[U]; Apr. 16, 1987, 62-58143[U]
Int. Cl.[4] H03H *7/01*
U.S. Cl. 333—183 **18 Claims**



1. A chip-like LC filter comprising:
a magnetic element having a first through hole extending along a longitudinal axial direction thereof;
a capacitor element provided with a first terminal electrode formed on an outer peripheral surface thereof, a second through hole extending along a longitudinal axial direction thereof, and a second terminal electrode formed on an inner peripheral surface thereof and defining said second through hole;
a central conductor comprising a cylindrically rolled metal plate made of a resilient material, said metal plate thereby tending to resiliently unroll and exert an outward pressure

radially of said central conductor, and inserted in said first and second through holes which are aligned along said axial direction to retain said magnetic element and said capacitor element in an axially aligned state, said central conductor being electrically connected with said second terminal electrode of said capacitor element; and

first and second external terminal means respectively provided on rsplective longitudinal end portions of said central conductor, said first and second external terminal means being electrically connected with said central conductor; and

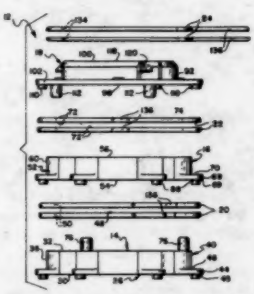
said central conductor being provided along at least part of its length along said longitudinal direction with an elastic contact portion which exerts said outward pressure radially of said central conductor to come into pressure contact with said second terminal electrode of said capacitor element to be electrically connected with the same, said elastic contact portion being located on an outer peripheral part of said rolled metal plate.

4,908,591

STATIC CONVERGENCE DEVICE FOR TELEVISION PICTURE TUBE

Albert M. Anthony, Paw Paw, Mich., assignor to Bangor Electronics Co., Bangor, Mich.

Filed Feb. 7, 1989, Ser. No. 307,430
Int. Cl.[4] H01F 7/00
U.S. Cl. 335—210 **18 Claims**



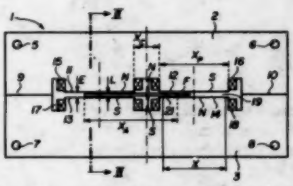
1. A device for mounting a pair of magnet rings on a substantially cylindrical neck comprising a cylindrical collar having a central axis adapted to be disposed coaxial with the neck and a diameter greater than the diameter of the cylindrical neck, a first plurality of elongated fingers mounted at one end thereof on the collar and extending toward the central axis, and a second plurality of elongated fingers mounted at one end thereof on the collar and extending toward the central axis, each of the fingers having an end opposite the collar with an elongated straight edge parallel to the central axis and disposed on a cylindrical surface of revolution with a diameter less than the diameter of the cylindrical neck, and the fingers of the first and second pluralities intersecting the cylindrical surface of revolution at supplementary acute angles, a pair of flat cylindrical rings of magnetic material provided with a central cylindrical opening of a diameter greater than the outer diameter of the cylindrical collar, and means for mounting the rings in abuttment with each other with the openings of the rings disposed co-axially about the collar.

4,908,592

ELECTROMAGNETIC ACTUATING DEVICE

Claude Oudet, Besancon, France, assignor to Portescap, La Chaux-de-Fonds, Switzerland

PCT No. PCT/CH87/00063, § 371 Date Feb. 1, 1988, § 102(e) Date Feb. 1, 1988, PCT Pub. No. WO87/07757, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 1, 1987, Ser. No. 162,333
Claims priority, application Switzerland, Jun. 2, 1986, 228/86
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—229 **10 Claims**



1. An electromagnetic actuating device comprising:

a movable member comprising at least one part magnetized perpendicularly to the direction of its movement, the thickness of the magnetized part measured in the direction of the magnetization being substantially constant over the length of the path of relative movement of a stationary point with respect to a point located closely on the magnetized part, and being small with respect to the length of the magnet measured along this same path of movement, the magnetized part being made of a material having in the whole working range a substantially linear demagnetization characteristic and a reversible permeability close to that of air; and

a stator structure comprising at leasst one magnetic circuit made of a material of a very high magnetic permeability, and having an air-gap in which at least one portion of said magnetized part is arranged, the stator structure further comprising at least one electric energizing coil coupled with said magnetic cirucit,

wherein the magnetized part has a single pair of magnetic poles, the magnetization being practically uniform and extending over a length X_A measured along the path of movement of a point of the magnetized part located in the air-gap,

wherein the stator structure comprises on at least one side of the air-gap two polar parts surrounded by respective energizing coils, said polar parts having each a length X_P measured along the same path of movement as X_A, and being spaced by a distance X_C also measured along that path of movement, X_A being substantially greater than X_C and notably smaller than $X_C+2\,X_P$,

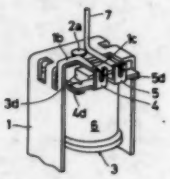
wherein the movable member is arranged to allow the magnetized part to effect a movement limited to a maximum length of movement of X/2 in both directions from a position of symmetry between said polar parts, X being measured as X_P and being no greater than $X_P-0.5$ E, wherein X_P is greater than 8 E and E designates a constant dimension of the air-gap measured perpendicularly to said paths of movement at the place of a polar part, and

wherein the stator structure is arranged so that the magnetic fluxes generated by the magnetized part in said structure are closed in said material of high magnetic permeability outside of said air-gap.

4,908,593
SOLENOID APPARATUS

Makoto Takayanagi, Toyokawa, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 19, 1988, Ser. No. 246,108
Claims priority, application Japan, Sep. 17, 1987, 62-233484
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—255 4 Claims

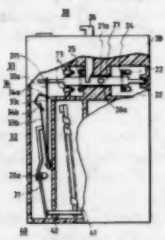


1. A solenoid apparatus comprising:
a core of magnetic material;
a plunger of magnetic material movably disposed at one end of said core;
a bobbin surrounding at least a portion of each of said core and said plunger;
an electric coil wound in said bobbin;
a first terminal mounted on said bobbin and connected to one end of said electric coil with said first terminal having a first connection arm electrically connected thereto;
a second terminal mounted on said bobbin and connected to the other end of said electric coil;
a yoke of magnetic material connected to the opposite end of said core and covering at least a portion of said electric coil; and
a second connection arm connected to said yoke and said first connection arm to electrically connect said bobbin coil to said yoke.

4,908,594
THERMAL OVERLOAD RELAY

Katsumi Akiike, and Haruo Ichikawa, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 6, 1988, Ser. No. 215,854
Claims priority, application Japan, Jul. 14, 1987, 62-175333; Sep. 9, 1987, 62-137676[U]
Int. Cl.[4] H01H 71/16
U.S. Cl. 337—49 11 Claims

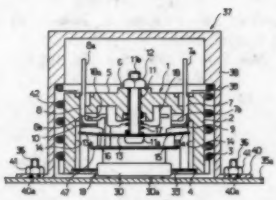


1. A thermal overload relay comprising:
a. a bimetallic strip adapted to be deformed when an overcurrent flows therethrough;
b. a change-over mechanism comprising:
a shifter connected to an end of said bimetallic strip to be shifted thereby upon deformation of said bimetallic strip,
a rotatable release lever having a first end and a second end, said first end contacting said shifter to rotate said release lever in response to said shifting of said shifter; and
a spring mechanism having a first spring for engaging said second end of said release lever and a second spring, said first spring having a first stable state, a second stable state, and a free end, said second spring for moving said first spring from said first stable state to said second stable state in response to rotation of said release lever; and
c. a contact mechanism including a contact support engaged with said free end of said first spring for establishing a first contact condition when said first spring is in said first stable state and a second contact condition when said first spring is in said second stable state,
wherein said change-over mechanism and said contact mechanism are assembled independently and said change-over mechanism possesses no electrically conductive portion in either said first stable state or said second stable state.

4,908,595
MOTOR PROTECTOR

Masahiko Niino, Minami, Japan, assignor to Yamada Electric Mfg. Co., Ltd., Japan

Filed May 12, 1989, Ser. No. 351,873
Int. Cl.[4] H01H 61/07, 71/16; H02H 5/04
U.S. Cl. 337—105 4 Claims



1. A motor protector comprising:
(a) a case having an open end;
(b) a pair of terminal plates secured to the case and each provided with a fixed contact;
(c) a bimetallic member supported in the case and provided with two movable contacts which are engaged with the fixed contacts in a normal curvature condition of the bimetallic member, respectively, the bimetallic member reversing its curvature with snap action in response to heat such that the movable contacts are disengaged from the fixed contacts respectively;
(d) a temperature-sensitive switch mounted in the case so as to close the open end thereof, the temperature-sensitive switch sensing the temperature of a sensed object and being turned on when the temperature thereof reaches a predetermined value under the influence of heat from the sensed object; and
(e) a heater provided in the vicinity of the bimetallic member and connected in series to the temperature-sensitive switch.

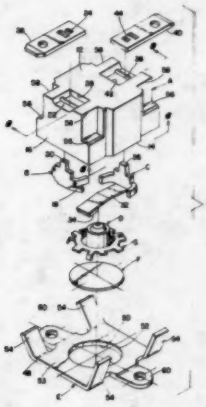
4,908,596
THERMOSTAT ASSEMBLY

Gordon K. Wells, and Bradley D. Funk, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Feb. 17, 1989, Ser. No. 311,811
Int. Cl.[4] H01H 37/52
U.S. Cl. 337—354 17 Claims

10. In a thermostat including a housing having an internal disc receiving recess surrounded by a shoulder, a bimetal disc spacing said recess and having an outer peripheral surface

portion engaging said housing adjacent said shoulder, a switch case in said housing, disc biasing means positioned between said bimetal disc and said switch case for biasing said peripheral surface portion of said disc into firm engagement with said housing shoulder, said biasing means acting on said disc only closely adjacent its outer periphery, attaching means on said disc biasing means for attaching said disc biasing means to said



switch case and for locating same in a predetermined position relative to said switch case during assembly of said housing to said switch case, and locating means on said disc biasing means cooperable with said bimetal disc for locating and maintaining said disc biasing means and bimetal disc in predetermined relationship to one another during assembly of same into said housing.

4,908,597

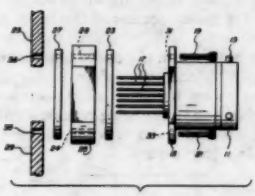
CIRCUIT MODULE FOR MULTI-PIN CONNECTOR

Christopher Sutton, 3749 Calle Casino, San Clemente, Calif., and Richard Colburn, 22350 Cheraw Dr., Saugus, Calif. 91350

Division of Ser. No. 43,619, Apr. 28, 1987, Pat. No. 4,773,880. This application Mar. 16, 1988, Ser. No. 169,007

Int. Cl.[4] H01C *7/10*

U.S. Cl. 338—21 **6 Claims**



1. A metal oxide varistor for use in the body of a multi-pin connector or a circuit module attached to a multi-pin connector, comprising:

a metal oxide wafer configured to fit within said body of a multi-pin connector or said circuit module, said wafer including a plurality of apertures therein at least one aperture lined up with a connector pin for insertability therethrough;

a metallized pad on one side of the metal oxide wafer, around the aperture so that electrical contact is made with the connector pin when it is inserted through the aperture in the metal oxide wafer;

a grounded metallized layer positioned on the surface of the metal oxide wafer, other than the surface with the pads, without making contact with a connector pin inserted through an aperture in the wafer so that any current flowing from the metallized pad to the grounded metallized layer would have to pass through a substantial portion of metal oxide component; and

an insulating layer enshrouding the exterior of the varistor.

4,908,598

ROTARY POTENTIOMETER

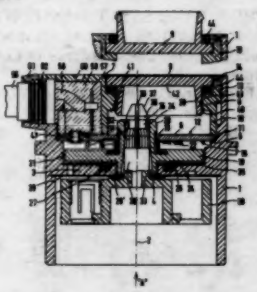
Rita Burger, Grafing, and Horst Plaulla, Ottobrunn, both of Fed. Rep. of Germany, assignors to Wilhelm Ruf KG, Munich, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 261,931

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736546

Int. Cl.[4] H01C *10/34*

U.S. Cl. 338—174 **6 Claims**



1. A rotary potentiometer comprising:

a casing having an opening adapted to be closed by a cover;

a resistor core having a top surface facing the opening and a bottom surface fixed in the casing, the resistor core having a resistor path applied to its bottom surface, inaccessible from the opening;

a spring carrier supported for rotation in the casing;

a slider spring fixed to the spring carrier and being in sliding electrical contact with the resistor path on the resistor core;

means, positioned on a side of the casing remote from the opening, for coupling a shaft to the spring carrier; and

the casing includes an opening at its side remote from the means for coupling the shaft to the spring carrier which opening is adapted to be closed by a cover and through which

at least one trimming resistor, disposed on the top surface of the resistor core and accessible through the opening when the cover is removed, electrically connected to the resistor path by through plating through the resistor core.

4,908,599

TEMPERATURE-SENSITIVE RESISTANCE ELEMENT

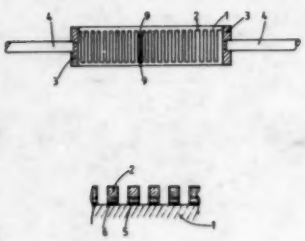
Brian E. Breen, Hunnington, and Ian R. Harris, Cannock, both of United Kingdom, assignors to Lucas Electrical Electronic Systems Limited, England

Continuation of Ser. No. 27,526, Mar. 18, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 237,665

Claims priority, application United Kingdom, Apr. 1, 1986, 8607874

Int. Cl.[4] H01C 7/10

U.S. Cl. 338—22 R 9 Claims



1. A temperature-sensitive resistance element, comprising an electrically insulating substrate supporting a temperature-sensitive resistance layer wherein said temperature-sensitive resistance layer is recrystallised electroplated palladium.

4,908,600

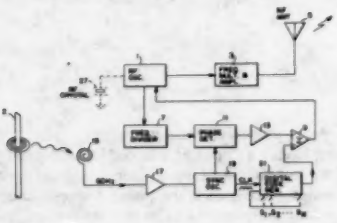
NARROW BAND SYNCHRONIZED RADIO COMMUNICATION AND ALARM SYSTEM

Louis Martinez, Cerritos, Calif., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 11, 1988, Ser. No. 179,660

Int. Cl.[4] H04M 11/04

U.S. Cl. 340—310 R 19 Claims



1. A narrow band digital communication system comprising:

transmitting means at a first location for transmitting a radio signal which is frequency shifted according to a first digital code sequence and time referenced to the frequency of a power line; and

receiving means at a second location for receiving said transmitted signal and deriving the first digital code sequence therefrom, said receiving means generating a second digital code sequence at a time referenced to the frequency of a power line, and comparing the first and second digital code sequences such that when the digital code sequences are identical, an output signal will be generated.

4,908,601

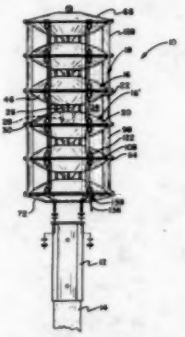
LOUD SPEAKER WITH HORIZONTAL RADIATION PATTERN

Bruce W. Howze, Springfield, Pa., assignor to Whelen Technologies, Inc., Chester, Conn.

Filed Jul. 27, 1987, Ser. No. 78,101

Int. Cl.[4] G08B 3/00

U.S. Cl. 340—388 17 Claims



1. A speaker comprising:

a substantially circular speaker lower horn member having an upwardly facing surface which includes a substantially convex annular portion and a substantially concave central cavity portion, said lower horn member having a central axis;

a substantially circular upper horn member having a downwardly facing surface which includes a substantially convex outer portion and a central opening, said upper horn member having a central axis;

means for spacing the upper horn member coaxially with and immediately above the lower horn member to thereby define an annular, radially outwardly diverging sound director between the upper and lower horn members, said sound director being substantially symmetrical relative to a plane which is generally transverse to the axis of said horn members, said plane intersecting said axis at a point intermediate said spaced lower and upper horn members;

diffuser means coupled to the central opening of the upper horn member and extending downwardly through said plane into the cavity portion of the lower horn member; and

driver means mounted in the upper horn member and coupled to the diffuser means for projecting sound through the diffuser means into the cavity portion of the lower horn member, the sound being reflected upwardly out of the cavity into the sound director whereby the sound is projected in a 360° pattern.

4,908,602

APPARATUS AND METHOD OF TESTING A PORTABLE HELD BUTTON FOR EMERGENCY RESPONSE SYSTEM

Richard M. Reich, Westwood, and Phillip H. Devlin, Brookline, both of Mass., assignors to Lifeline Systems, Inc., Watertown, Mass.

Filed Mar. 31, 1989, Ser. No. 331,460

Int. Cl.[4] G08B 29/00

U.S. Cl. 340—514 14 Claims

1. An apparatus for testing the functioning and operating limitations of a personal emergency response system including a subscriber station capable of transmitting messages over a communications link to a central station, comprising:

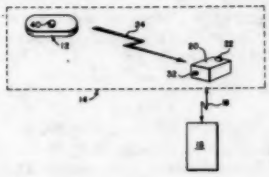
portable help button means selectively operable for generating an activating signal at the subscriber station;

subscriber unit means disposed within the subscriber station and normally operative in response to said activating signal for transmitting one or more messages over the communications link to the central station;

annunciator means coupled to said subscriber unit

means and operative in response to said activating signal received by said subscriber unit means for generating a perceptible signal indicative of functioning of said subscriber unit means and said portable help button means; and

momentary action button means coupled to said subscriber unit means and selectively actuatable for alternately operating said subscriber unit means in a test mode and a normal mode; and wherein



operation of said subscriber unit means in said normal mode causes said subscriber unit means to activate said annunciator means to generate said perceptible signal and to transmit one or more messages over the communications link to the central station in response to said activating signal generated by selective operation of said portable help button means; and wherein

operation of said subscriber unit means in said test mode causes said subscriber unit means to activate said annunciator means to generate said perceptible signal in response to said activating signal generated by selective operation of said portable help button means, said subscriber unit means being inoperative in said test mode to transmit messages to the central station.

4,908,603

LIGHT EMITTING ALARM BOARD

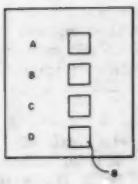
Satoshi Yamaue, Kiyomi-so, 7-1, Nishikitsuji-kawara-machi, Nara-shi, Nara-ken, Japan; Koichi Tanaka, 1-243-1, Minamikidera-cho, Nara-shi, Nara-ken, Japan; Hiroaki Nakaya, 2613-1, Ichinomoto-cho, Tenri-shi, Nara-ken, Japan; Takuo Yamashita, 99-2, Toyoi-cho, Tenri-shi, Nara-ken, Japan, and Masaru Yoshida, 5-6-1, Tatsuta-kita, Ikaruga-cho, Ikoma-gun, Nara-ken, Japan

Continuation of Ser. No. 149,637, Jan. 28, 1988, abandoned. This application Apr. 11, 1989, Ser. No. 338,410

Claims priority, application Japan, Feb. 4, 1987, 62-23968

Int. Cl.[4] G08B *25/00*; **B60Q** *1/00*

U.S. Cl. 340—525 **6 Claims**



1. A light-emitting alarm board comprising a board, and

a plurality of thin-film EL elements adapted to emit light of different colors according to voltages applied thereon, said EL elements being stacked on said board and one on top of another in the direction of light emission therefrom, each of said EL elements being provided with an electrode terminal such that one or more of said EL elements can be selectably caused to emit light of one of said different colors or an intermediate color of said different colors, said alarm board thereby serving as display lamps for indicating the condition of operation of a system being monitored.

4,908,604

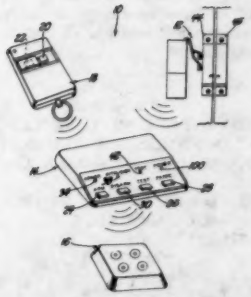
REMOTELY CONTROLLED SECURITY SYSTEM

Keith D. Jacob, Ann Arbor, Mich., assignor to Dimango Products Corporation, Brighton, Mich.

Filed Sep. 21, 1987, Ser. No. 98,802

Int. Cl.[4] G08B *1/08, 23/00*

U.S. Cl. 340—539 **28 Claims**



16. An assembly as set forth in claim 15 further characterized by said console means (14) including console receiver means (80) for receiving said coded radio signals from said remote control means (18) and said entrance monitoring means (12) to produce a detecting signal, and amplifier limiter means (82, 84) for amplifying and magnitude limiting said detected signal producing a coded signal, and entrance monitor decoder means (86) for receiving and decoding said coded signal producing an intrusion signal when said entrance monitoring means (12) has produced an intrusion coded signal indicating that the entrance has been intruded, and controller decoder means (88) for receiving and decoding said arming coded radio signal and said disarming coded radio signal to produce a mode signal representative of the armed or disarmed mode of said console means (14).

4,908,605

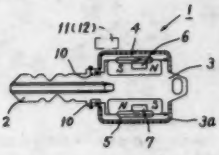
DEVICE FOR CONFIRMING WHETHER A LOCK IS LOCKED OR UNLOCKED

Jitsuho Takatsuka, Yokohama, Japan, assignor to Hiroshi Hasegawa, Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,257

Int. Cl.[4] E05B *45/06*

U.S. Cl. 340—542 **14 Claims**



1. Device for confirming whether a lock is locked or unlocked, comprising:

a key having a head, said head including at least one reed switch;

a lock capable of being locked and unlocked by said key, said lock having a front face; and

switch actuating means, comprising:

at least one bias magnet in said head, each said bias magnet being disposed adjacent a respective said at least one reed switch; and

at least one first and at least one second driving magnet connected to said lock and disposed in spaced relation to each other and proximate said front face, the polarity of said at least one first driving magnet being opposite the polarity of said at least one second driving magnet;

whereby when said at least one bias magnet comes into proximity with one of said at least one first or at least one second driving magnets during the locking or unlocking of said lock with said key, said at least one reed switch is appropriately activated according to the resultant strength of the superposed magnetic fields of said at least one bias magnet and said one of said first and second driving magnets.

4,908,606

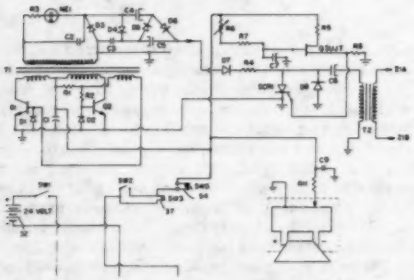
THEFT RESISTANT SECURITY CONTAINERS USING SHOCKING WIRES AND AUDIO ALARM

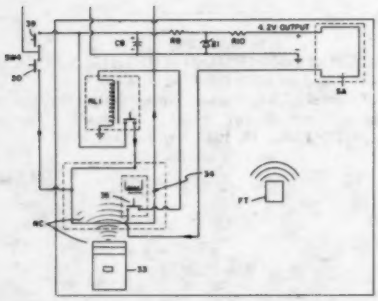
Raffi Kevonian, 4960 Hollywood Blvd. #D, Los Angeles, Calif. 90027

Filed Dec. 28, 1987, Ser. No. 138,913

Int. Cl.[4] G08B *13/14, 13/18*

U.S. Cl. 340—571 **8 Claims**





1. A security container, comprising:

(a) a housing having exterior walls including a surface-engaging wall, said exterior walls defining an interior compartment;

(b) a means for gaining access to said interior compartment;

(c) a multiplicity of operatively interconnected electrical conductors disposed proximate said exterior walls of said housing;

(d) a source of electrical current carried by said housing;

(e) a first switch means carried by said housing for selectively interconnecting said source of electrical current with said multiplicity of electrical conductors, said first switch means comprising first and second mechanically operated switches;

(f) a remotely located transmitter means for transmitting an electrical signal in the direction of said housing;

(g) a receiver means for receiving said signal from said transmitter means to energize said electrical conductors when the appropriate one of said first and second mechanically operated switches is closed; and

(h) second switch means comprising a normally open mechanical switch carried by said surface-engaging wall and closing if said surface-engaging wall is moved away from the surface with which it is in engagement to energize said electrical conductors.

4,908,607

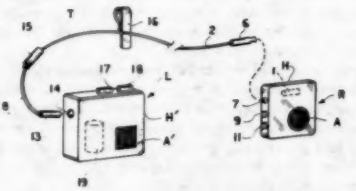
ANTI-PICKPOCKET ALARM

Julian J. Yannotti, 8-18 College Point Blvd., Queens, N.Y. 11356, and Thomas Johnson, 18 Kensington Pl., East Orange, Nev. 02017

Filed Feb. 23, 1989, Ser. No. 313,886

Int. Cl.[4] G08B *13/14*

U.S. Cl. 340—571 **8 Claims**



1. A portable security apparatus comprising;

a remote housing adapted to be carried within an article desired to be protected by an individual,

an energy source within said housing,

an alarm device adapted to be driven by said energy source,

a flexible elongated tether having opposite end portions, said tether being long enough so that when stretched from an individual the end distal of the individual is out of reach of the individual,

connection means on one said tether end portion removably joining said tether to said housing,

said alarm device activated upon separation of said tether from said remote housing,

a local housing adapted to be carried adjacent the person of said individual,

a second alarm device within said local housing,

detachable securing means joining said other tether end portion to said local housing, and

an energy source within said local housing and adapted to drive said second alarm device within said local housing.

4,908,608

ALARMCARD

Dana J. Reinke, 1053 NW. 166th St., Seattle, Wash. 98177, and D'Arcy A. J. Dawe, 19515 NE. 181st, Woodinville, Wash. 98072

Filed Aug. 1, 1988, Ser. No. 226,787

Int. Cl.[4] G08B *13/14*; G06F *7/04*

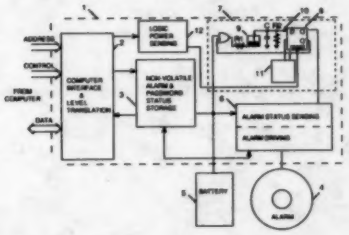
U.S. Cl. 340—571 **21 Claims**

1. A security device for use with equipment having a microprocessor comprising:

a warning means responsive to a change in the equipment from a predetermined condition of the equipment;

a driving means for driving said warning means;

a sensing means for sensing said change from said predetermined condition, said sensing means capable of sending a signal to said driving means in response to said change from said predetermined condition;



an interface means for connecting the equipment to said security device, said interface means capable of inputting information from the microprocessor of the equipment through said security device; and,

program means for controlling the warning means, driving means, and sensing means, said program means capable of transmitting information to the microprocessor of the equipment.

4,908,609

COLOR DISPLAY DEVICE

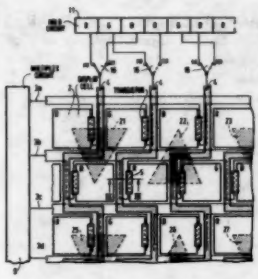
Martinus V. C. Stroomer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1987, Ser. No. 34,194

Claims priority, application Netherlands, Apr. 25, 1986, 8601063

Int. Cl.[4] H04N *9/30*

U.S. Cl. 340—702 **20 Claims**



1. A display device for color display comprising

an electro-optical medium,

a pattern of line electrodes crossing a pattern of column electrodes to provide display elements in a matrix of picture cells of said electro-optical medium,

wherein at least two adjacent rows of said picture cells constitute a row of N color elements,

first means for driving said line electrodes,

conversion circuit means for sampling incoming signals having a length of t_0, said incoming signals being displayed at a frequency of $f_0 = N/t_0$, and said conversion circuit means converting each of said incoming signals into at least two sampling signals applied to said column electrodes during a display period of t_1, where $t_1 > t_0$,

wherein only one of said two sampling signals is applied to said column electrodes during driving of a line electrode associated with at least one row of said picture cells, said line electrode being energized during a period of at most $\frac{1}{2}t_1$.

4,908,610

COLOR IMAGE DISPLAY APPARATUS WITH COLOR PALETTE BEFORE FRAME MEMORY

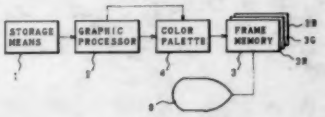
Takahiko Yamamuro, and Nobuo Fukushima, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,111

Claims priority, application Japan, Sep. 28, 1987, 62-243064; Sep. 28, 1987, 62-243065

Int. Cl.[4] G09G *3/16*

U.S. Cl. 340—703 **4 Claims**



1. A color image display apparatus comprising;

a memory means which stores image information composed of image data and palette data to be used for restoring original image from compressed color information;

a graphic processor which reads out image information from said memory means;

a color palette which is given image data and palette data from said graphic processor and then restores color image data from image data in accordance with palette data;

a frame memory which stores color image data restored by said color palette; and

a display unit which displays image data stored in said frame memory.

4,908,611

HEAD-UP DISPLAY APPARATUS FOR AUTOMOTIVE VEHICLE

Tadashi Iino, Susono, Japan, assignor to Yazaki Corporation, Japan

Continuation of Ser. No. 169,428, Mar. 17, 1988, abandoned. This application Jul. 24, 1989, Ser. No. 384,083

Claims priority, application Japan, Mar. 17, 1987, 62-60144

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—705 **8 Claims**

1. A head-up display apparatus for an automotive vehicle, which comprises:

(a) first displaying means for displaying display images toward a driver taking a front seat, said first displaying means being any one of a half mirror and a hologram plate disposed on a dashboard and inside a windshield;

(b) second displaying means for displaying display images toward a passenger taking a rear seat, said second displaying means being a mirror disposed at about a middle position between two front seats; and

(c) projecting means for selectively projecting display im-

ages toward any one of said first and second displaying means, said projecting means being disposed at a ceiling within a passenger compartment.

4,908,612

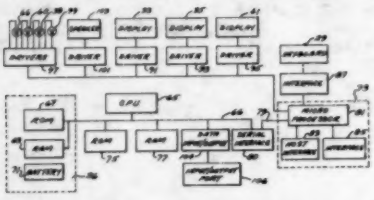
COMPUTER INPUT-OUTPUT DEVICE

Eric Bromley, West Simsbury, and Robert Harris, Collinsville, both of Conn., assignors to Penguin Products, Inc., Bloomfield, Conn.

Filed Sep. 29, 1987, Ser. No. 103,431

Int. Cl.[4] G09G *3/02*

U.S. Cl. 340—706 **16 Claims**



1. An interactive intelligent computer I/O device for permitting a user to control the execution of a selected target program on a host computer, said host computer having a keyboard port for connecting a keyboard to the host computer, said target program providing to the user groups of tasks, each of said groups of tasks being provided at a different point during the execution of the target program, each of said tasks being identifiable by a task name and each of said tasks being performable by the target program at the point in the execution of the target program that the group of tasks including the task is provided, wherein the user may direct execution of a particular task of the group of tasks provided by transmitting a particular set of keystroke codes to the host computer; comprising;

host computer interface means for connecting the I/O device to the keyboard port of the host computer so that information may be transmitted between the I/O device and the host computer;

interchangeable memory means for providing a stored control program to condition the I/O device to control the execution of the selected target program, said control program providing to the user groups of procedures, each of said groups of procedures corresponding to one of the groups of tasks provided by the target program, each of said procedures of the group of procedures corresponding to one of the tasks in the corresponding group of tasks provided by the target program, wherein each procedure may be identified by the task name of the task corresponding to the procedure;

first processing means for executing the control program and for synchronizing execution of the control program with execution of the target program so that each group of procedures is provided by the control program to the user at the point in the execution of the target program that the group of tasks corresponding to the group of procedures is provided to the user by the target program;

display means, responsive to the control program, for presenting groups of procedures to the user, said display means having a plurality of sections wherein each section presents a procedure of the group of procedures and each section is identified by the task name of the task corresponding to the procedure;

means for selecting a procedure from the group of procedures presented by the display means, said means for selecting being actuable to provide a signal indicative of the procedure selected;

second processing means, responsive to the selection signal, for generating sets of keystroke codes to direct the execution of the task corresponding to the procedure selected; and

third processing means for transmitting the set of keystroke codes from the I/O device to the host computer to direct the execution of the task corresponding to the selected procedure.

4,908,613

DISPLAY DEVICE

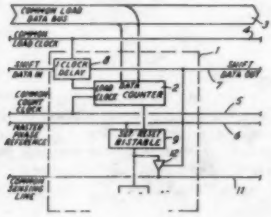
Ian M. Green, Buckie, Scotland, assignor to Thorn EMI plc, London, England

Filed Sep. 18, 1987, Ser. No. 98,169

Claims priority, application United Kingdom, Sep. 20, 1986, 8622714

Int. Cl.[4] G09G *3/02*

U.S. Cl. 340—719 **13 Claims**



1. A display device for displaying a picture represented by picture-signals, the display device comprising:

a lattice of pixels for displaying the picture;

an associated counter for each pixel, each associated counter being operable for continuous counting; and

means to operate each associated counter to effect actuation of each pixel for a time period dependent upon at least the value of the picture-signal for that pixel.

4,908,614

IMAGE DATA OUTPUT APPARATUS

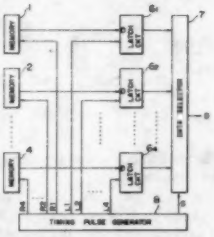
Tooru Yamagishi, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 10, 1988, Ser. No. 166,237

Claims priority, application Japan, Mar. 11, 1987, 62-54072

Int. Cl.[4] G09G *1/06*

U.S. Cl. 340—723 **4 Claims**



1. A image data output apparatus wherein a plurality of read clock signals from a timing pulse generator are sequentially applied one after another to a plurality of memories to read out therefrom each one of a plurality of pixel data stored therein corresponding to a plurality of pixels constituting an image, said plurality of read-out pixel data are applied to latch circuits to latch said read-out pixel data upon application of latch signals from the timing pulse generator to the latch circuits,

and a plurality of said latched pixel data are applied to a data selector to serially output the plurality of latched pixel data therefrom upon application of data selector signals from the timing pulse generator to the data selector, the:

a plurality of said latch circuits corresponding in number to that of the plurality of said memories are provided, each of the plurality of latch circuits being supplied with pixel data from a corresponding one of the plurality of memories,

a plurality of read clock signals are outputted from said timing pulse generator at different respective timings, each respective one of said plurality of read clock signals being applied to a respective one of said plurality of memories, and

a plurality of respective latch signals are outputted from said timing pulse generator at different respective timings, each respective one of said plurality of latch signals being applied to a corresponding respective one of said plurality of latch circuits.

4,908,615

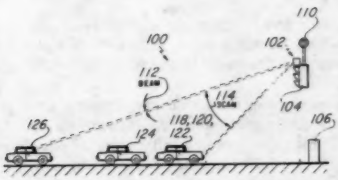
TRAFFIC LIGHT CONTROL SYSTEM AND METHOD

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 67,527, Jun. 26, 1987. This application Aug. 9, 1988, Ser. No. 230,205

Int. Cl.[4] G08G *1/08*

U.S. Cl. 340—917 **8 Claims**



1. A traffic light control system, comprising:

(a) a transmitter/receiver, said transmitter/receiver for transmitting a beam towards a roadway, detecting reflections of said beam from vehicles on said roadway, and outputting a detection signal; and

(b) circuitry connected to said transmitter/receiver, said circuitry converting said detection signal into traffic light control signals;

(c) said transmitter/receiver including an array of active antennas, each of said active antennas having:

i. an oscillator including a power source and a resonator; and

ii. a radiator coinciding with said resonator;

(d) said transmitter/receiver further including interconnections among said active antennas, said interconnections coupling said active antennas together.

4,908,616

TRAFFIC CONTROL SYSTEM

Jonothan P. Walker, 12206 E. 58th Ter., Kansas City, Mo. 64133

Filed Oct. 11, 1988, Ser. No. 255,326

Int. Cl.[4] G08G *1/096*

U.S. Cl. 340—929 **8 Claims**

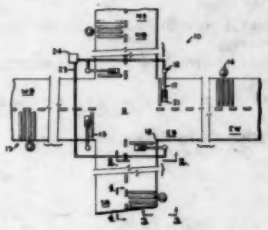
1. A traffic control system for a street intersection, which comprises:

(a) intersection signal means for intermittently signalling an imminent stop signal associated with the intersection;

(b) pre-intersection signal means associated with a reaction distance from said intersection;

(c) signal control means adapted for selectively energizing said intersection signal means in response to a predetermined condition;

(d) said predetermined condition for causing said signal



control means to actuate said intersection signal means comprising a predetermined time interval; and

(e) said intersection signal means including red, yellow, green and flashing green signal light units.

4,908,617

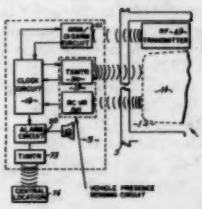
PARKING STALL MONITOR

Kip L. Fuller, Denver, Colo., assignor to Innovision Technologies Group, Inc., Denver, Colo.

Filed May 10, 1988, Ser. No. 192,346

Int. Cl.[4] G08G *1/14*

U.S. Cl. 340—932.2 **21 Claims**



1. A parking stall monitor for indicating unauthorized use of a parking stall comprising:

means for detecting the presence of a vehicle in said parking stall and for providing a warning signal upon detecting said vehicle presence; and

means for selective disarming and arming of said means for detecting presence and providing a warning signal, thereby to enable an authorized vehicle to occupy said parking stall without said warning signal being provided, said selective arming and disarming means including a transmitter adapted to transmit an encoded signal and a receiver adapted to receive said encoded signal from said transmitter and in response thereto, to provide an arm/disarm signal to said presence detecting means.

4,908,618

ABNORMAL START ADVISORY SYSTEM (ASAS) FOR AIRCRAFT ENGINES

Thomas M. Baker, Renton; Michael T. Dunn, Federal Way; Jeffrey E. Duven; Jim W. Hackler, both of Renton; Peter J. Louden, Mercer Island, and Clifford M. Schjoneman, Issaquah, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1988, Ser. No. 290,591

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—945 **1 Claim**

1. A flight deck information system for providing a flight

crew warning in the event of an abnormal engine operating condition in the sub-idle region comprising in combination:

first means for providing a signal representative of engine exhaust temperature;

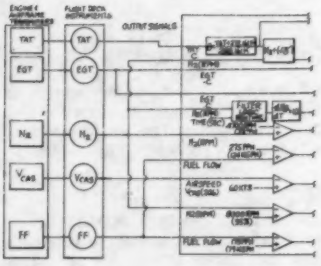
second means for providing a signal representative of engine core rotor speed;

third means for providing a signal representative of total air temperature;

fourth means for providing a signal representative of engine fuel flow;

fifth means for providing a signal representative of calibrated airspeed;

a flight crew warning device; and,



a signal processing circuit coupled to said first, second, third, fourth, and fifth means for providing a sub-idle abnormal engine condition signal to said flight crew warning device when all of conditions d. through f. are simultaneously satisfied with one or more of conditions a. through c.:

a. Engine EGT≧Sliding EGT function limit.

b. Engine EGT≧725° C.

c. Engine core rotor acceleration (dN2/dt)<50 RPM/SEC and N2≧4700 RPM.

d. Engine fuel flow>275 LBS/HR.

e. Airframe calibrated airspeed<60 Knots.

f. Engine core rotor speed<8000 RPM.

4,908,619

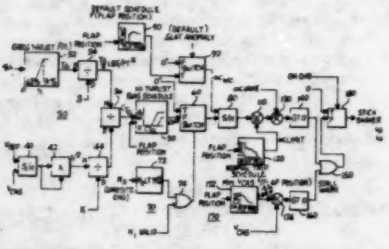
AIRCRAFT STALL WARNING SYSTEM

Paul F. Bala, Issaquah; Edgars A. Kupcis, Redmond, and William B. Fisher, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 13, 1984, Ser. No. 671,134

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—966 **9 Claims**



1. Apparatus for producing an aircraft stall warning signal comprising:

a means for producing a signal a representative of aircraft angle of attack;

$\Delta\alpha$ means for producing a signal $\Delta\alpha$ which is predeterminedly related to engine thrust level; and

comparator means for comparing said a and said $\Delta\alpha$signals and producing a stall warning signal in response to a predetermined relationship therebetween.

4,908,620

ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTER

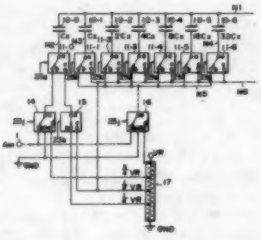
Akihiko Fujisawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 305,383

Claims priority, application Japan, Feb. 9, 1988, 63-28472

Int. Cl.[4] H03M *1/02*

U.S. Cl. 341—108 **7 Claims**



1. An analog-to-digital and digital-to-analog converter comprising:

a capacitor array comprising a plurality of capacitors, each of which has capacitance differently weighted from the others and has one electrode connected to a common node;

first switch means for selectively applying, in response to a first control signal, either one of an analog input applied to an analog input terminal and a plurality of reference voltages to another electrode of said capacitors;

comparator means provided with a pair of input terminals which are selectively operative as an inverting and a non-inverting input switchable with respect to polarity in response to a second control signal, said comparator means comparing a voltage appearing on said node and applied to one of said input terminals and one of the reference voltages applied to the other input terminal;

an analog output terminal connected to an output of said comparator means;

successive comparison register means for sequentially taking in outputs of said comparator means in response to a third control signal;

a latch for selectively taking in and temporarily holding either one of digital inputs applied via a digital input terminal and outputs of said successive comparison register in response to the second control signal;

a digital output terminal connected to an output of said latch; and

a timing generating circuit for generating the first and third control signals in response to an output of said latch.

4,908,621

AUTOCALIBRATED MULTISTAGE A/D CONVERTER

John D. Polonio, Beaverton; Bruce J. Penney, Portland, and John Lewis, Tigard, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 6, 1988, Ser. No. 215,667

Int. Cl.[4] H03M *1/06*

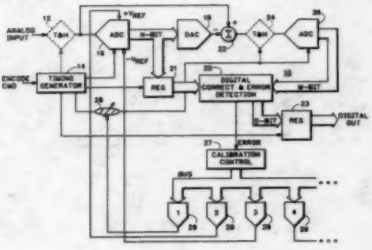
U.S. Cl. 341—120 **6 Claims**

1. An improved multistage analog to digital converter of the type having a plurality of analog to digital converter stages such that the output of the digital to analog converter stage is subtracted from the analog input to the prior analog to digital

converter stage prior to input to the subsequent analog to digital converter stage, the outputs of the analog to digital converter stages being converted to a digital output corresponding to an analog signal input to the first analog to digital converter stage, wherein the improvement comprises:

means for comparing a current output digital signal derived from the analog to digital converter with an immediately preceding output digital signal to produce a slope indicator;

means for generating an out of range indicator from the most



significant bits of the digital output of one of the analog to digital converter stages;

means for combining the slope indicator, the out of range indicator and the remaining bits of the digital output of the one analog to digital converter stage to produce an error signal; and

means for varying error correction levels for each of a plurality of variable correction devices for each analog to digital converter stage in response to the error signal such that the quantization error is minimized during operation of the analog to digital converter.

4,908,622

PROCESS AND CIRCUIT FOR SAMPLING ACCORDING TO INSTANTANEOUS SIGNAL VALUE, INDEPENDENT FROM THE FREQUENCY RANGE OF THE SIGNAL TO BE RECORDED

Endre Turai, Miskolc, Hungary, assignor to Nehezipari Muszaki Egyetem, Miskolc, Hungary

Continuation-in-part of Ser. No. 713,384, Feb. 20, 1985, abandoned. This application Jan. 20, 1988, Ser. No. 146,131

Claims priority, application Hungary, Jun. 20, 1983, 2187/83

Int. Cl.[4] H03M *1/14*

U.S. Cl. 341—122 **7 Claims**

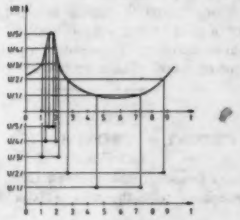
1. Method of real time sampling a signal, comprising:

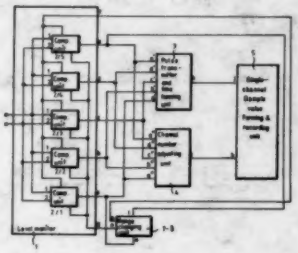
supplying an input signal;

establishing a desired signal value range comprising a plurality of differently valued monitoring levels within said desired signal value range;

simultaneously comparing said input signal with each of said plurality of monitoring levels;

detecting every time at which said input signal has a value equal to that of a said monitoring level; and





recording an independent time variable representative of each said detection of said input signal value equal to that of a said monitoring level.

4,908,623

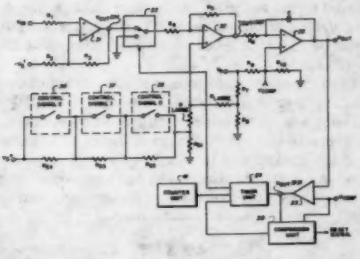
APPARATUS AND METHOD FOR RANGE CONTROL AND SUPPLY VOLTAGE COMPENSATION IN A DUAL SLOPE ANALOG TO DIGITAL CONVERTER

David C. Ullestad, Albuquerque, N. Mex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 8, 1988, Ser. No. 230,083

Int. Cl.[4] H03M *1/52*

U.S. Cl. 341—167 **22 Claims**



1. A dual slope analog to digital converter circuit comprising:

a first operational amplifier with a capacitor coupled thereto configured as an integrating circuit;

a second operational amplifier having an output terminal coupled to an inverting input terminal of said first operational amplifier;

a switch responsive to control signals for coupling a known voltage to an inverting terminal of said second operational amplifier when said switch is in a first state, said switch

coupling an analog voltage to said inverting terminal of said second operational amplifier when said switch is in a second state; and

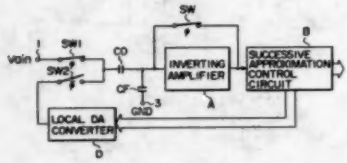
resistor network means for applying a reference signal to a non-inverting terminal of said first operational amplifier, said resistor network means applying a predetermined portion of a reference signal applied to a non-inverting terminal of said first operational amplifier to a non-inverting input terminal of said second operational amplifier.

4,908,624

SUCCESSIVE APPROXIMATION TYPE A/D CONVERTER

Junkei Goto, Kawasaki, and Tetsuya Iida, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 7, 1988, Ser. No. 216,046
Claims priority, application Japan, Jul. 8, 1987, 62-170199
Int. Cl.[4] H03M 1/12
U.S. Cl. 341—172 **6 Claims**



1. A successive approximation type A/D converter comprising:

a circuit, connected to one terminal of a first capacitor, for sampling an analog signal input in a sample mode and supplying the sampled analog signal input to said one terminal of said first capacitor;

a voltage comparator, connected to the other terminal of said first capacitor, for comparing an input terminal voltage in the sample mode with an input terminal voltage in an approximation mode;

a local D/A converter for generating a local analog signal in the approximation mode in accordance with a successive approximation control digital signal and supplying the local analog signal to said voltage comparator through said first capacitor;

a successive approximation type control circuit for successively outputting the successive approximation control digital signal in the approximation mode while determining values of bits of an A/D conversion output on the basis of a logic level of an output from said voltage comparator; and

a second capacitor connected between an input terminal of said voltage comparator and a fixed potential terminal having a predetermined voltage, said second capacitor preventing leakage of charge at the input terminal of said voltage comparator to a degree that the input terminal is held at a voltage between and not approximating either of a supplied voltage and said predetermined voltage.

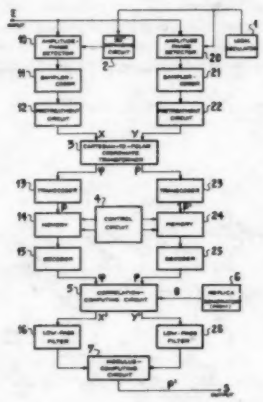
4,908,625

DEVICE FOR PROCESSING SIGNALS FROM A SIDE-LOOKING RADAR

Pierre Anthouard, and Roland Carre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 15, 1977, Ser. No. 769,891
Claims priority, application France, Apr. 2, 1976, 7609708
Int. Cl.[4] G01S 13/90, 7/44
U.S. Cl. 342—25 **11 Claims**

1. A device for processing video signals from a side-looking radar receiver, comprising input means for sampling and coding in digital form the phase ϕ and the amplitude ρ of the incoming video signals, storage means for registering samples received and coded during a given number M of successive recurrences, generating means for producing M digital phase



samples θ_i of a constant-modulus syntehtic replica signal, correlation means for computing, for each recurrence and each section of a sweep range, the sums

$$X' = \sum_{i=1}^{M} \rho_i \cos(\phi_i - \theta_i) \text{ and } Y' = \sum_{i=1}^{M} \rho_i \sin(\phi_i - \theta_i),$$

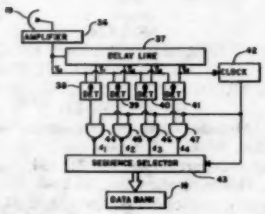
from 2M phase samples ϕ_i and modulus samples ρ_i registered during the M preceding recurrences and M successive and respective samples θ_i of the replica signal, and arithmetic means for computing the modulus of the signal whose cartesian components are X' and Y'.

4,908,626

COMMUNICATION SYSTEM FOR RADAR GROUND SYSTEMS

Richard S. Loucks, Northridge, Calif., assignor to ITT Corporation, New York, N.Y.

Division of Ser. No. 8,066, Jan. 13, 1987, Pat. No. 4,866,447, which is a continuation of Ser. No. 645,983, Aug. 31, 1984, abandoned. This application Jul. 26, 1989, Ser. No. 385,625
Int. Cl.[4] G01S 13/86
U.S. Cl. 342—60 **1 Claim**



1. A communications system comprising:

transmitter means including a first clock; an oscillator having 0° and 180° outputs; a single-pole double-throw electronic switch connected to receive selectively said 0° output or said 180° output; first means connected from said switch pole to transmit a coded signal; a first data bank; a first sequence selector, said first clock being con-

nected to said oscillator and to said first sequence selector, said first sequence selector being connected to shift said switch pole to produce a code in accordance with data in said first data bank; receiver means spaced from said transmitter means and including a second clock; means to produce an amplified signal when received; second means to produce delays of 1, 2, 3 . . . n bits of said amplified signal; first, second, third . . . nth phase detectors to receive inputs according to said 1, 2, 3 . . . n bits, respectively, each of said phase detectors having said amplified signal as a second input; first, second, third . . . nth NAND gates connected respectively from said first, second, third . . . nth phase detectors; a second sequence selector, said second clock being connected from said nth bit to a second input of each of said NAND gates and to said second sequence selector, each of said NAND gates having an output connected to said second sequence selector; and a second data bank connected from said second sequence selector to receive the output thereof.

4,908,627

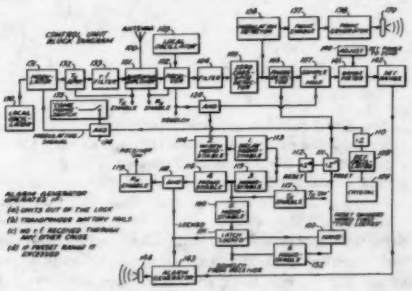
MONITORING, RANGING AND LOCATING DEVICES

James P. Santos, 223 Rockingstone Ave., Larchmont, N.Y. 10538

Continuation of Ser. No. 744,522, Jun. 14, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 149,974

Int. Cl.[4] G01S *13/08, 13/74*

U.S. Cl. 342—125 **14 Claims**



1. Ranging apparatus comprising first and second transceiver units, each said transceiver unit containing an RF transmitter, RF receiver and control circuitry, said control circuitry including means for determining the distance between said first and second units independent of the received RF field strength of the transmitter of the other unit, said control circuitry of said first unit including means for causing its associated transmitter to transmit an RF pulse, upon receipt of said RF pulse by the receiver of said second unit, the control circuitry of said second unit causing its associated transmitter to transmit a reply RF pulse, said control circuitry of said first unit including means for measuring the time interval between said transmitted pulse and said received replay RF pulse, display means connected to said control circuitry for indicating the determined distance between the units, means for triggering an alarm signal when the determined distance exceeds a predetermined amount said control circuitry of said second unit further including means for interrupting RF transmission from its associated transmitter upon receipt of a predetermined triggering signal, said control circuitry of said first unit including means for detecting the absence of said RF signal from said transmitter of said second unit and generating an alarm signal therefrom.

4,908,628

RADAR APPARATUS

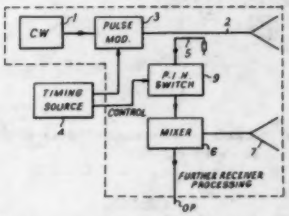
Ernest R. Cashen, Shepton Mallet, and Peter A. R. Holder, Bristol, both of England, assignors to E M I Limited, Hayes, England

Filed Jul. 7, 1981, Ser. No. 285,394

Claims priority, application United Kingdom, Jul. 7, 1980, 8021850; May 8, 1981, 8114114

Int. Cl.[4] G01S *13/18*

U.S. Cl. 342—134 **3 Claims**



1. A radar apparatus comprising

means for transmitting a pulse of electromagnetic energy and for receiving a corresponding return pulse,

coupling means coupled to the pulse transmitting means to produce an electrical reference pulse having the same duration as the transmitted pulse,

a mixer connected to receive the return pulse at a first input,

switching means interconnecting said coupling means and a second input to the mixer and being selectively operable, in response to control signals, to assume first and second states in which said coupling means is respectively connected to, and disconnected from, said second input,

timing means arranged to generate control signals for causing the pulse transmitting means to transmit a pulse of said duration and to select said first state of the switching means for a first predetermined portion of said duration and to select the second state for the remainder of the duration, so that a modified pulse of duration equal to the common interval of occurence of the second state and the return pulse is produced at the output of the mixer,

and means for processing the modified pulse to derive range information therefrom.

4,908,629

APPARATUS FOR LOCATING AND/OR TRACKING STOLEN OR MISSING VEHICLES AND THE LIKE

Sheldon P. Apsell, Newton, and Norval D. Stapelfeld, Brookline, both of Mass., assignors to Lo-Jack Corporation, Boston, Mass.

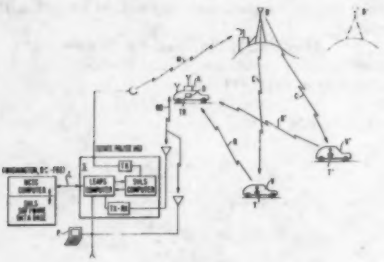
Division of Ser. No. 847,152, Mar. 31, 1986, Pat. No. 4,818,998. This application Dec. 5, 1988, Ser. No. 279,775

Int. Cl.[4] G01S *5/02*

U.S. Cl. 342—457 **3 Claims**

1. Transponder vehicle tracking apparatus having, in combination, direction-finding means for receiving activated vehicle transponder periodic radio reply signals carrying vehicle identification code information and for alphanumerically displaying the same; means also responsive to the last-named means for simultaneously displaying both the bearing from which the transponder reply signals are received and the signal strength thereof; means for locking onto and displaying only radio reply signals of a selected vehicle transponder; means for requesting the transmission of a transponder command signal that com-

mands an increased rate of transmission of the periodic transponder reply signals; and means for displaying said code



information and said signal strength at such increased rate to aid in homing-in on the vehicle.

4,908,630

MEDIUM-FREQUENCY ROTATING JOINT FOR ANTENNA

Jean-Michel Clerc, Brunoy, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 25, 1988, Ser. No. 236,242

Claims priority, application France, Aug. 28, 1987, 87 12038

Int. Cl.[4] H01Q *3/02*; H01P *1/06*

U.S. Cl. 343—763 **12 Claims**

1. A rotating joint to transmit signals between a rotating antenna and its fixed support, comprising:

two cylindrical, concentric parts which are assembled to be rotatable with respect to each other, and which are separated over a certain length by a ring-shaped space;

a stack of pairs of concentric, coplanar flat insulating rings, disposed in said ring-shaped space, said pairs of rings being separated by pairs of spacers, wherein each ring of a pair comprises two faces, the first faces including first ring shaped to the other ring of said pair, and the second faces including second ring shaped metallic strips along rims of said second faces which are nearest to the other ring of said pair and wherein said rims of said two faces which are the nearest to the other ring of said pair include means for connecting strips of the two faces of a ring, so as to form an open-ended coil winding, to form the rotating joint thus having pairs of matched and inductively coupled circuits which are shielded from one another.

4,908,631

ULTRASONIC PIXEL PRINTER

Charles DeBoer, Rochester, and Michael Long, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

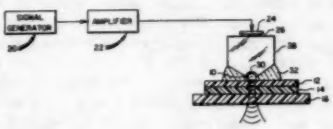
Filed Jul. 21, 1988, Ser. No. 222,650

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—76 R **3 Claims**

1. In an ultrasonic thermal printing system in which ultrasonic energy is applied to dye in a dye carrier to cause the dye to sublime and transfer to a receiver, the improvement comprising:

ultrasonic transmission means for selectively transmitting ultrasonic energy in a frequency range of from about 1 to 500 MHz for a selected pixels in the dye carrier, such transmitted energy being sufficient to cause dye in a selected pixel to sublime and/or melt and transfer to a receiver; and



lens means including a lens for receiving ultrasonic energy from said ultrasonic transmission means for focusing such energy into the dye carrier to cause dye to sublime and transfer into the receiver.

4,908,632

THERMAL PRINTING APPARATUS

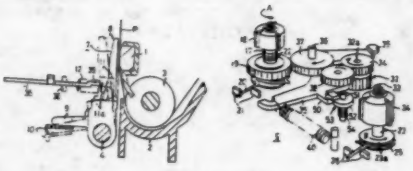
Shigeo Ishikawa; Hiroshi Tokuda, and Akira Ninomiya, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 7, 1989, Ser. No. 307,056

Claims priority, application Japan, Mar. 10, 1988, 63-56899

Int. Cl.[4] G01D *15/10*; B41J *3/20*

U.S. Cl. 346—76 PH **11 Claims**



1. A thermal printing apparatus comprising:

drive means actuated to move a carriage along a platen;

a thermal print head supported on said carriage;

a ribbon cassette detachably mounted on said carriage and including a ribbon spool around which a thermal transferable ribbon is wound;

a rotatable spool shaft mounted on said carriage and engageable with said ribbon spool to rotate said ribbon spool;

means for transmitting rotational force from said drive means to said spool shaft, said transmitting means being selectively changeable between a first state wherein said rotational force generated by actuation of said drive means is transmitted to said spool shaft, and a second state wherein transmission of said rotational force to said spool shaft is interrupted;

means for detecting if a ribbon cassette is mounted on said carriage; and

means for holding said transmitting means in said second state when mounting of a ribbon cassette is not detected.

4,908,633

PHOTOSENSITIVE MICROCAPSULE RECORDER WITH TRANSFER SHEET TRANSPORTED AT AN ANGLE RELATIVE TO THE AXIAL DIRECTION OF THE PRESSURE ROLLERS

Kunio Ohashi, and Syoichi Nagata, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1988, Ser. No. 291,180

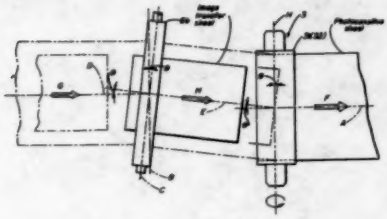
Claims priority, application Japan, Dec. 28, 1987, 62-333105; Jan. 14, 1988, 63-6676

Int. Cl.[4] G03B *27/52*; G01D *9/42*; G03C *1/72*

U.S. Cl. 346—107 R **7 Claims**

1. In an image forming apparatus adapted to form an image by superposing an image transfer sheet over a photosensitive

sheet, said photosensitive sheet having a surface thereof coated with microcapsules encapsulating a light-curable agent and a colorless dye and said image transfer sheet having one surface thereof coated with a developing agent having an chromogenic effect on said colorless dye, and by rupturing unhardened ones of said microcapsules by compressing said photosen-



sitive sheet and said image transfer sheet superposingly together between a pair of pressure rollers, the improvement wherein said image forming apparatus comprising means for transporting said image transfer sheet to said pressure rollers by tilting said image transfer sheet by a tilting angle greater than 0.5° from the axes of said pressure rollers.

4,908,634

LASER POWER CONTROL FOR CUT-PAPER PRINTER

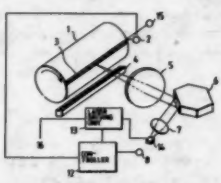
Akira Arimoto, Kodaira; Susumu Saito, Hachioji; Yasuyuki Tsuji; Osamu Namikawa, both of Katsuta, and Takeshi Mochizuki, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,116

Claims priority, application Japan, Feb. 9, 1988, 63-26645

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—108 **28 Claims**



1. In a laser scanning printer system, wherein a laser beam is modulated to affect printing as it scans a rotatable member with a repeatable scan cycle of relative scan movement between the rotatable data recording medium and the laser beam, and feed relative movement at right angles to said scan movement between cycles, wherein the improvement comprises:

said rotatable member having a non-printing surface without any data handling capability, and extending for a length corresponding to at least one scan cycle, and being in the path of said laser beam only for a non-printing portion of the period representing the entire path of relative feed movement of laser beam and rotatable medium that traverses the entire data region of said recording medium in said feed direction; and

means for correcting the power of the laser beam only during said non-printing portion so that the frequency of light reflection between said laser beam and said non-printing surface is equal to the frequency of scan lines divided by a relatively large whole number integer.

4,908,635

INK JET RECORDING APPARATUS WITH DENSITY CONTROL FUNCTION

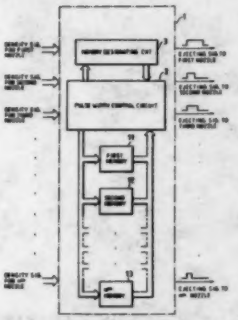
Toshiyuki Iwasawa, Tokyo, and Masayoshi Miura, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 185,020

Claims priority, application Japan, Apr. 24, 1987, 62-102254

Int. Cl.[4] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—140 R **2 Claims**



1. An ink jet recording apparatus comprising:

an ink jet head which includes a plurality of ink nozzles, a plurality of air nozzles each disposed in opposite relation with each of said ink nozzles, means for discharging air flow from said air nozzles and means for applying an electric field between said air nozzles and ink in said ink nozzles;

density determining means for determining a recording density at every ink nozzle of said plurality of ink nozzles and generating a density information signal; and

control means responsive to said density determining means and having memory means storing a plurality of density-to-signal characteristics each being predetermined to correspond to said plurality of ink nozzles and each representing the relation between the recording density and an ink ejecting signal to be applied to one of said ink nozzles, for selecting a characteristic from said density-to-signal characteristics at every ink nozzle and generating said ink ejecting signal indicative of an ink ejecting amount determined on the basis of said density information signal from said density determining means in accordance with the selected density-to-signal characteristic, said ink ejecting signal being applied to the electric field applying means;

wherein said ink ejecting signal is a pulse signal having a constant amplitude and a pulse width designated on the basis of said density information signal in accordance with the selected density signal characteristic.

4,908,636

RECOVERY DEVICE HAVING A PROTRUDING PORTION PROVIDING REDUCED PRESSURE FOR IMPROVED RECOVERY AND METHOD USING SAME

Atsushi Saito, Yokohama; Yutaka Koizumi, Tokyo; Toshihiro Mori, and Minoru Nozawa, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,462

Claims priority, application Japan, Mar. 31, 1987, 62-76353

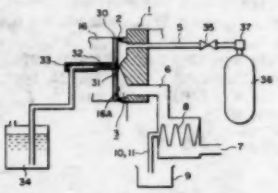
Int. Cl.[4] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—140 R **22 Claims**

1. A liquid jet recording apparatus including a liquid jet recording head having discharge ports for discharging recording liquid, said recording apparatus comprising:

a cap member for covering the discharge ports, the cap

member being provided with a protruding portion opposed to the discharge ports; and



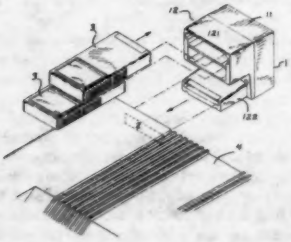
means for generating a gas flow passed said protruding portion in a space formed by said cap member and the liquid jet recording head to create a reduced pressure for removing impurities from the discharge ports.

4,908,637

FONT CARTRIDGE ADAPTER

J. M. Chung, and Jerry Kung, both of Taipei, Taiwan, assignors to Acer Incorporated, China

Filed Jan. 30, 1989, Ser. No. 303,758
Int. Cl.[4] G01D *15/00;* **G11C** *5/06;* **G41J** *29/02, 5/51*
U.S. Cl. 346—160 **1 Claim**



1. A font cartridge adapter for inserting in the cartridge opening of a laser printer comprising:

a font shell open on one side and having an interior cavity;

connector means in which font cartridges can be inserted, said connector means being positioned in the upper part of the interior cavity of the front shell;

slot means positioned in the bottom of the lower part of the interior cavity of said front shell;

a circuit board connector having one end inserted in said slot means;

means for receiving font cartridge selection signals from the circuit board connector, outputting the same to said connector means, and transmitting a data signal of the selected character or symbol from said connector means to said circuit board connector; and

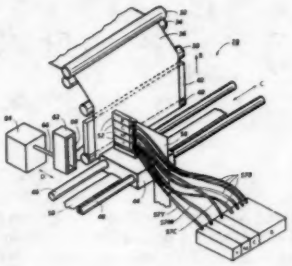
a rear shell open on one side to engage with the open side of said front shell, the other side of said rear shell having a spaced apart font cartridge insert-end and printer connector-end, the font cartridge insert-end having a plurality of channels for accommodating the font cartridges, the printer connector-end having a conduit for accommodating the circuit board connector and being insertable in the cartridge opening of the laser printer.

4,908,638

INK JET MARKING HEAD HAVING MULTICOLOR CAPABILITY

Chester A. Albosta, Foster City, and Suresh C. Paranjpe, Fremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 15, 1988, Ser. No. 285,133
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **8 Claims**



1. An ink jet marking device for marking upon a receptor sheet movable in a transport direction, comprising a plurality of ganged marking heads having arrays of ink ejecting orifices generally aligned in the transport direction and capable of marking in a plurality of colors, a scanning carriage reciprocably movable in a direction normal to the transport direction supports said marking heads, ink reservoir means including a first color ink supply container and plural other color ink ink supply containers, and conduit means for interconnecting said marking heads and said ink supply containers, said device being characterized by

one of said marking heads being connected to said first color ink supply container,

each of said other marking heads being connected to said first color ink supply container and to one of said other color ink ink supply containers, and

diverting means associated with said other marking heads and movable from a first position to a second position for allowing either said first color ink or one of said other color inks to pass to said ink ejecting orifices of said other marking heads.

4,908,639

OPTICAL SYSTEM HAVING A VARIABLE OUT-OF-FOCUS STATE

Masaaki Yanagisawa, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,157
Claims priority, application Japan, Apr. 11, 1988, 63-88454
Int. Cl.[4] G02B *13/20, 9/62*
U.S. Cl. 350—431 **5 Claims**

1. An optical system including:

a forward group having a first lens group of positive focal length and a second lens group of negative focal length, said forward group having a positive focal length;

a stop; and

a rearward group having a positive focal length, said forward group, said stop and said rearward group being disposed in the named order from the object side, the spacing between said first lens group and said second lens group being varied along the optic axis to thereby fluctuate the spherical aberration and coma of said optical system and vary the depictive property of the image of the defocus area and also, fluctuate the astigmatism of said optical system following the fluctuations of the spherical aberration and coma, thereby maintaining the flatness of

the image plane, said optical system being constructed so as to satisfy the following conditions:

$$0.5 < |f_2/f| < 1.0$$

$$0.5 < |f_1/f_2| < 1.5$$

where f is the focal length of the entire system of said optical system, and f_1 and f_2 are the focal lengths of said first lens group and said second lens group, respectively.

4,908,640

APPARATUS FOR TAKING PHOTOGRAPH WITH MONITORING SYSTEM

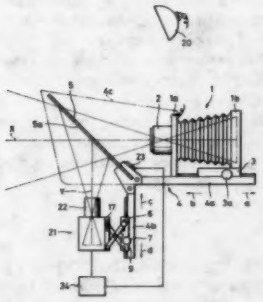
Nobuyuki Masuda, Saitama, Japan, assignor to Mamiya Camera Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1988, Ser. No. 282,777

Claims priority, application Japan, Dec. 14, 1987, 62-189613

Int. Cl.[4] G03B *17/50*

U.S. Cl. 354—75 **14 Claims**



1. An apparatus for taking photographs with a monitoring system comprising:

a primary camera having a lens with an optical axis and a shutter for taking an objective photograph of an object;

a still video camera having a lens for monitoring the object; and

a half mirror disposed in front of said lens of said primary camera obliquely in relation to said optical axis of said lens of said primary camera,

said lens of said still video camera and said lens of said primary camera being located at symmetrical positions to each other with respect to said half mirror.

4,908,641

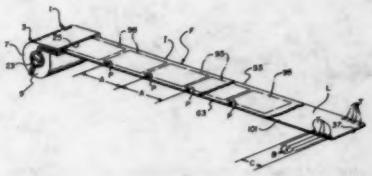
PHOTOGRAPHIC FILM AND FILM CASSETTE

Patricia D. Fairman, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1989, Ser. No. 349,480

Int. Cl.[4] G03B *17/26*

U.S. Cl. 354—275 **7 Claims**



1. An improved film cassette wherein (a) a filmstrip has a relatively short non-protruding leader portion and a relatively long imaging portion including a longitudinal series of spaced identical metering perforations having a common pitch to enable said imaging portion to be precisely metered for picture-taking in a camera and (b) a film spool is rotatable in a film unwinding direction to propel said filmstrip beginning with said leader portion out of said cassette for engagement of the leader portion with a take-up spool in the camera, and wherein the improvement comprises:

said leader portion includes a longitudinal series of spaced identical take-up perforations having a common pitch that is substantially less than the pitch of said metering perforations to enable the leader portion to be engaged by a take-up spool in a camera, whereby because of the difference between the respective pitches of said metering perforations and said take-up perforations the possibility of mistaking the take-up perforations for the metering perforations in the camera may be prevented.

4,908,642

CAMERA

Hiroshi Komatsuzaki, 2-26-30 Nishi-azabu, Minato-ku, Tokyo, Japan; Seiji Asano, 1-324 Uetake-cho, Omiya-shi, Saitama, Japan, and Yoshihiro Fujita, 2-26-30 Nishi-azabu, Minato-ku, Tokyo, Japan

Continuation of Ser. No. 181,539, Apr. 15, 1988, abandoned. This application May 26, 1989, Ser. No. 357,681

Claims priority, application Japan, Apr. 20, 1987, 62-97871; Apr. 20, 1987, 62-97872

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **5 Claims**

1. A camera comprising:

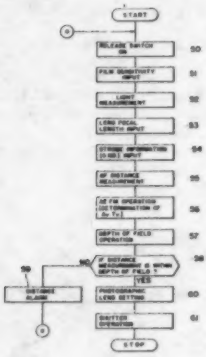
a detection means for detecting photographic conditions;

distance measuring means for measuring the distance between an object and a photographic lens;

focusing means including said photographic lens for focusing on said object; and,

control means responsive to output signals of said detection means and distance measuring means to determine a photographable distance range corresponding to said photographic conditions in accordance with said output

signals, wherein said photographable distance range is determined based on whether a distance measurement



value obtained by said distance measuring means is in a range of the depth of field.

4,908,643

AUTOMATIC FOCUSSING ADJUSTING DEVICE

Kazukiyo Tamada; Naoki Takatori, both of Tokyo; Tsuneo Yokoyama; Satoshi Mikajiri, both of Omiya; Mineo Kubota, and Hiroshi Saito, both of Kofu, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 20, 1988, Ser. No. 246,815

Claims priority, application Japan, Sep. 21, 1987, 62-237023; Sep. 21, 1987, 62-237024; Sep. 21, 1987, 62-237025

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **17 Claims**

1. An automatic focussing adjusting device comprising: focus detect means for detecting the state of forming of an image of an object on the focal plane which is formed by the incident light of a zoom lens; lens drive means for driving a group of focus lenses in said zoom lens; and control means for calculating an amount of de-focussing ΔP in accordance with the detect output of said focus detect means, for finding the amount of movement ΔX of said focus lens group necessary for focussing on said focal plane according to said amount of de-focussing ΔP, the magnification m of a group of magnification varying lenses in said zoom lens and the focal distance thereof fe, and for outputting to said lens drive means a control signal to move said focus lens group by said amount of movement ΔX, said control means further including correction coefficient setting means for setting a correction coefficient α for the magnification m of said magnification varying lens group, said control means generating and using the factor $\alpha \cdot m$ in place of the magnification m of said magnification varying lens group for calculating said control signal to move said focus line group by said amount of movement ΔX.

4,908,644

OPTICAL FILTERING DEVICE AND METHOD FOR USING THE SAME

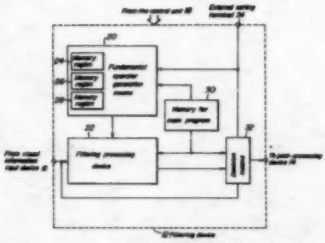
Osamu Shindo; Noboru Suzuki, and Shigeo Toji, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,794

Claims priority, application Japan, Mar. 23, 1987, 62-68541

Int. Cl.[4] G03B *3/00*; **G06F** *7/38, 15/336*

U.S. Cl. 354—402 **26 Claims**



1. A filtering device for effecting a filtering process in a space-domain of initial image data derived from an external visual image input source, said filtering device comprising:

(a) fundamental operator generation means for generating fundamental operators within at least one fundamental operator series;

(b) filter processing means for convolving an initial input image data array and successive input image data arrays with respective fundamental operators to produce successive output image data arrays representative of the convolved input image data arrays;

(c) means for determining whether each said successive output image data array satisfies at least one predetermined condition; and

(d) means for selectively sending one of said output image data arrays to a post-filter processing device only when each said predetermined condition is satisfied by said one output image data array.

4,908,645

AUTOMATIC FOCUS ADJUSTING DEVICE

Masaki Higashihara; Yasuo Suda, both of Yokohama; Ichiro Ohnuki, Kawasaki; Akira Akashi, and Terutake Kadohara, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,162

Claims priority, application Japan, Feb. 5, 1988, 63-025490; May 25, 1988, 63-127572

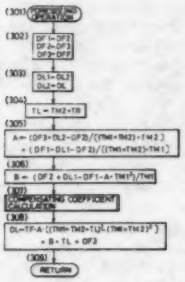
Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **18 Claims**

1. An automatic focusing device for driving a lens according to the output of a focus state detecting circuit, comprising:

(a) an operation circuit for determining the amount of lens driving for focusing to an object position after a predetermined time, utilizing a plural-order function and based on past plural focusing data in past plural focusing operations conducted by the focusing device;

(b) a driving circuit for driving the lens by the amount of lens driving determined by said operation circuit; and



(c) a compensation circuit for correcting a high-order coefficient of said plural-order function.

4,908,646

RANGE MEASURING DEVICE FOR CAMERA

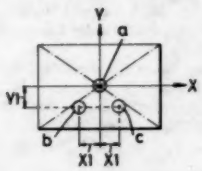
Shigemasa Sato; Akira Katayama, and Hiroshi Terunuma, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 10, 1988, Ser. No. 204,905

Claims priority, application Japan, Jun. 15, 1987, 62-148603; Apr. 5, 1988, 63-084358

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **15 Claims**



1. A range measuring device for use in a camera, comprising:

means for measuring the distance to an object in a predetermined area in the object field;

location detecting means for discriminating whether the object field is indoors or outdoors and generating respectively an indoor signal or an outdoor signal;

means for comparing the distance to said object with a first reference distance in response to said outdoor signal, or with a second reference distance, shorter than said first reference distance, in response to said indoor signal; and

means for determining the distance to said object field in response to the results of said distance measuring means and said comparing means.

4,908,647

LENS DRIVING DEVICE

Masayuki Ueyama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1989, Ser. No. 346,217

Claims priority, application Japan, May 6, 1988, 63-110970

Int. Cl.[4] E03B *3/10*

U.S. Cl. 354—402 **6 Claims**

1. A lens driving device for driving a focusing lens to stop said focusing lens at a desired position, comprising;

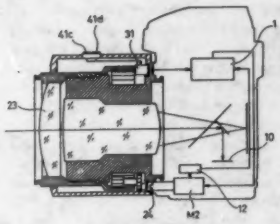
means, including a driving mechanism having a backlash, for driving said focusing lens along an optical axis thereof;

means for detecting a moving direction of said focusing lens;

means for storing a reference position of said focusing lens;

means for storing a moving direction of said focusing lens immediately before said focusing lens is stopped at said reference position;

means for comparing a present moving direction according to said moving direction detecting means with said stored moving direction; and



means for controlling said driving means so that said focusing lens moves through said desired position by a predetermined amount not less than the amount of said backlash, and said focusing lens reversely moves by said predetermined amount when said comparing means detects that said present moving direction is different from said stored moving direction.

4,908,648

DISTANCE MEASURING DEVICE FOR AUTOMATIC FOCUSING CAMERA

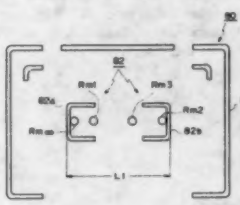
Kosaku Sawabe, Ichikawa, and Takashi Hongoh, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,019

Claims priority, application Japan, Dec. 30, 1987, 62-333804; Jan. 22, 1988, 63-10782; Jan. 22, 1988, 63-10783; Jan. 27, 1988, 63-14680; Oct. 19, 1988, 63-261629

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—403 **7 Claims**



1. A distance measuring device for an automatic focusing camera which is automatically focused on an object in accordance with information data of distance to the object from the camera which information data is obtained by irradiating a light emitted from a ligth emitting element to the object and receiving the light reflected from the object by a ligth receiving means so as to detect an incident point of the reflection light onto the light receiving means, wherein the distance measuring device comprises:

a first light emitting element disposed on an optical axis of a light emitting optical system;

a light receiving means disposed at a position perpendicularly away from the optical axis by a predetermined reference length;

a second light emitting element disposed at a position perpendicularly away from the optical axis on a side opposite

to the light receiving means with respect to the first light emitting element;

a light emission control means for controlling sequence of light emission from the first light emitting element and the second light emitting element;

a distance calculation means for calculating the information data of distance on the basis of an output from the light receiving means corresponding to the incident position of the reflection light to the light receiving means;

a first memory means and a second memory means for memorizing a first information data with regard to the first light emitting element and a second information data with regard to the second light emitting element, respectively, calculated by the distance calculation means in the same sequence as the predetermined light emission sequence;

a distance information data discrimination means for discriminating the information data from the first memory means and the second memory means so that, when the second information data is larger than a predetermined reference value, the second information data is determined to be effective, whereas when the second information data is smaller than the reference value, the first information data is determined to be effective; and

a finder having a distance measurable area mark disposed at a position perpendicularly away from the optical axis by a predetermined length so as to define a range of field in which the distance to the object can be measured,

wherein a first area and a second area are arranged in the finder in which the first area defines a range of measurable distance by using only the first light emitting element from the longest distance to the shortest distance to the object and in which the second area defines a range of measurable distance by using only the second light emitting element from the longest distance to the shortest distance to the object and wherein the longest distance side of the first area and the shortest distance side of the second area are overlapped each other in the finder.

4,908,649

AUTOMATIC FOCUS DETECTION DEVICE FOR USE IN A CAMERA

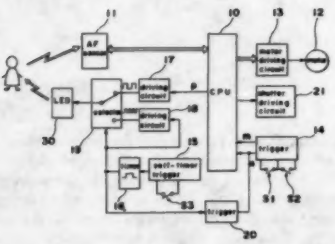
Toru Matsui, and Toshihiko Karasaki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 172,971, Mar. 22, 1988, abandoned, which is a continuation of Ser. No. 84,023, Aug. 11, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,652

Claims priority, application Japan, Aug. 12, 1986, 61-188986

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—403 **4 Claims**



1. A camera provided with an ordinary photographic mode and a self timer photographic mode in which an actual photographing is executed after a predetermined delay time from a provision of a trigger signal and a photographing optical system having a movable lens system for projecting an image of an object to be photographed onto a predetermined plane, an in-focus condition of the movable lens system being adjustable by moving said movable lens system,

said camera comprising;

a light source accommodated in a body of the camera,

a light projecting system for projecting light from said light source to the object,

an automatic focus detection device for detecting in-focus condition of said photographing optical system by the light projected from said light projecting system,

mode switching means for switching between the ordinary photographic mode and the self timer photographic mode, and

a light source driving circuit being changeable in response to operation of the mode switching means between a mode for turning said light source on and off during the delay time of the self-timer photographic mode and a mode for turning on said light source for another predetermined time so as to project the light to the object for detecting the in-focus condition of the photographic optical system in the ordinary photographic mode.

4,908,650

WATERPROOF CAMERA

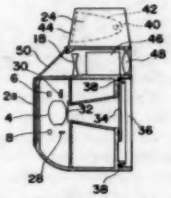
Nobuyuki Taniguchi, Nishinomiya; Takeo Hoda, Kawachinagano; Yoshiaki Hata, Nishinomiya; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 8,367, Jan. 29, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,641

Claims priority, application Japan, Jan. 31, 1986, 61-20698

Int. Cl.[4] G03B *7/041, 3/10, 17/08, 17/24*

U.S. Cl. 354—412 **28 Claims**



1. A waterproof camera comprising:

means for selecting a real focal length photographing mode and for selecting a pseudo focal length photographing mode that specifies a scope for printing that is narrower than the scope in the real focal length photographing mode;

means for recording a signal corresponding to the pseudo focal length photographing mode when the pseudo focal length photographing mode is selected; and

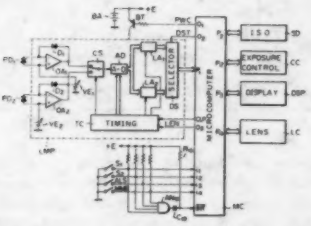
waterproof means for preventing water from entering inside the camerA while permitting said means for selecting to be physically manipulated, said waterproof means enclosing an objective lens of the camera so that the focal length of the objective lens cannot be varied through physical manipulation.

4,908,651

EXPOSURE CONTROL DEVICE FOR A CAMERA

Akihiko Fujino, Sakai; Mansbu Inoue, Kobe; Masaaki Nakai, Kawachinagano, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 895,035, Aug. 8, 1986, Pat. No. 4,779,117.
This application May 19, 1988, Ser. No. 195,959
Claims priority, application Japan, Aug. 9, 1985, 60-176046
Int. Cl.[4] G03B 7/08
U.S. Cl. 354—434 4 Claims



1. An exposure control device for a camera, comprising:
light measurement means for outputting light measurements corresponding to a plurality of light measurement regions of a scene to be photographed;
data storing means for analog-to-digital conversion and storing of a plurality of the light measurements with a first period to store the A/D converted values respectively;
reading means for reading out all the A/D converted values stored by the data storing means;
designation means for outputting a designation signal for designating a light measurement distribution, at least one of the A/D converted data being selected in accordance with the designation signal;
calculation means for carrying out an exposure calculation on the basis of the light measurement selected by the designation signal among said A/D converted values read by said reading means;
sequence control means for carrying out the operations of said reading means, designation means, and calculation means in sequence with a second period shorter than the first period; and
exposure control means for carrying out exposure control on the basis of the result obtained by the exposure calculation.

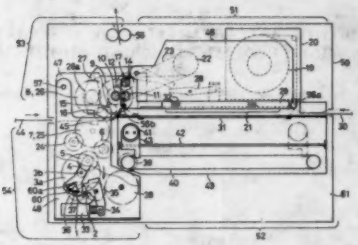
4,908,652

IMAGE RECORDING APPARATUS HAVING UPPER AND LOWER SECTIONS SEPARABLE FROM EACH OTHER AT MEDIUM EXPOSING PATH

Kiyoharu Hayakawa, Aichi; Yumio Matsumoto, Kasugai; Masashi Ueda, Nagoya; Akira Sago, Nagoya, and Osamu Takagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 1, 1988, Ser. No. 200,923
Claims priority, application Japan, Jun. 8, 1987, 62-142553; Jun. 9, 1987, 62-88971; Jun. 10, 1987, 62-144536; Jun. 10, 1987, 62-144598; Jun. 10, 1987, 62-144539; Jun. 10, 1987, 62-144540; Jun. 10, 1987, 62-144535
Int. Cl.[4] G03B 27/52
U.S. Cl. 335—27 18 Claims

1. An image recording apparatus comprising:
a medium supporting device for supporting a supply roll of a photosensitive recording medium in the form of a web, such that an active length of said web supplied from said supply roll extends along an exposing path;
an exposing device for imagewise exposing said active length of said web of the photosensitive recording medium to an image radiation representative of an original image to be reproduced, while said active length is placed in said exposing path;
a take-up roll for taking up the imagewise exposed active length of said web;
an upper section which is disposed above said exposing path



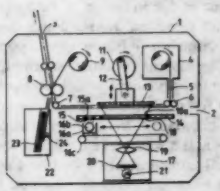
and which supports said medium supporting device, and said take-up roll;
a lower section which is disposed below said exposing path and which has said exposing device; and
separating means for separating said upper and lower sections from each other at said exposing path.

4,908,653

EXPOSURE SYSTEM FOR IMAGE RECORDING APPARATUS

Akira Sago; Masashi Ueda; Osamu Takagi, all of Nagoya; Yumio Matsumoto, Kasugai, and Kiyoharu Hayakawa, Ama, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 9, 1988, Ser. No. 204,239
Claims priority, application Japan, Jun. 10, 1987, 62-89132; Jun. 15, 1987, 62-91498
Int. Cl.[4] G03B 27/32, 17/00
U.S. Cl. 355—27 7 Claims



1. An exposure system for exposing a photosensitive recording medium to a light, comprising:
first exposure means disposed on the same side of said photosensitive recording medium for applying light to said photosensitive recording medium; and
second exposure means disposed on the same side of said photosensitive recording medium as the side on which said first exposure means is disposed for applying light to said photosensitive recording medium, wherein said first exposure means and said second exposure means selectively apply light to said photosensitive recording medium;
wherein said first exposure means comprises a first light source movable along said photosensitive recording medium, said first light source applying the light of said first exposure means to said photosensitive recording medium through a first original, and said second exposure means comprises a second light source, said second light source applying the light of said second exposure means to said

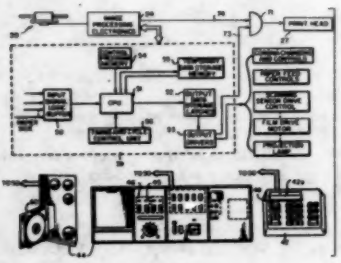
photosensitive recording medium through a second original, wherein when said second exposure means is applying the light to said photosensitive recording medium, said first exposure means is disposed in a position offset from a path of the light that said first light source applies to said photosensitive recording medium.

4,908,654

METHOD AND APPARATUS FOR AUTOMATIC PRINTING FROM MICROFILM OF SHORT IMAGE AREAS

Bruce A. Holroyd, Gates, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,597
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—41 **14 Claims**



1. In an apparatus for printing enlargements of image frames stored on a storage medium in miniature form the apparatus including display means for displaying an enlargement of the desired image frame to be reproduced, means for automatically locating the image frame for display on said display means, operator enterable selection means for cooperating with said automatic locating means for controlling said locating means so that said image frame is initially displayed automatically at a position convenient for viewing by said operator in accordance with his/her selection, reproducing means for forming an enlargement of one image frame upon a copy sheet of a size not substantially dependent upon the length of the image frame to be printed, the improvement which comprises:

control means for determining a first parameter related to the distance between a first reference associated with said image frame and a second reference associated with said apparatus and independent of said first reference and for determining a second parameter related to the length of said image frame and in response generating signals to control said reproducing means to reproduced said image frame on said copy sheet without reproducing an adjacent image frame on said same copy sheet and without the need for the operator to adjust the displayed image frame from that position selected for convenient viewing.

4,908,655

JAM DETECTING AND DISPLAYING DEVICE IN AN IMAGE RECORDING APPARATUS

Atsushi Takagi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

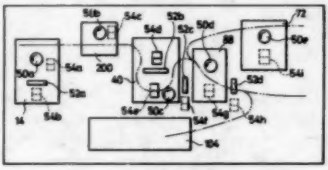
Filed Apr. 14, 1988, Ser. No. 181,353
Claims priority, application Japan, Apr. 14, 1987, 62-89824
Int. Cl.[4] G03G *15/00*; B65H *7/06*
U.S. Cl. 355—50 **3 Claims**

1. A jamming detecting and displaying device in an image recording apparatus, having jamming clearing members, which comprises:

jamming detecting means for detecting the jamming of an image recording material in said image recording apparatus;

jamming displaying means for displaying the position where jamming occurs and information concerning procedures for eliminating said jamming; and

control means responsive to said detecting means for determining a procedure for eliminating said jamming and



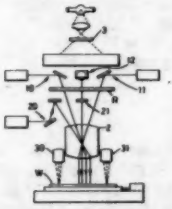
controlling said jamming displaying means to display information concerning said procedure, wherein said jamming displaying means comprises light means located proximtae each of said jamming clearing members, said control means operating said light means so as to identify the sequence and combination in which said jamming clearing members should be operated.

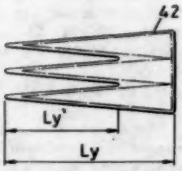
4,908,656

METHOD OF DIMENSION MEASUREMENT FOR A PATTERN FORMED BY EXPOSURE APPARATUS, AND METHOD FOR SETTING EXPOSURE CONDITIONS AND FOR INSPECTING EXPOSURE PRECISION

Kyoichi Suwa, Yokohama; Shigeru Hirukawa, Kashiwa, and Hiroki Tateno, Kawasaki, all of Japan, assignaors to Nikon Corporation, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 299,236
Claims priority, application Japan, Jan. 21, 1988, 63-11729; Jul. 20, 1988, 63-180654; Jul. 20, 1988, 63-180655
Int. Cl.[4] G03B *27/42*
U.S. Cl. 355—53 **14 Claims**





1. An exposure method for use in an apparatus for projecting a pattern formed on a mask onto a photosensitive substrate through a projection optical system, comprising the steps of:

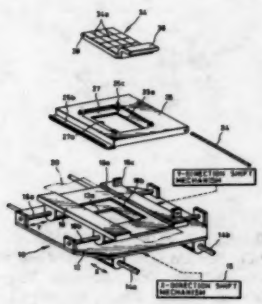
providing a mask bearing a pattern of which width gradually varies in a reference direction on the mask;
transferring said pattern onto said photosensitive substrate through said projection optical system;
measuring the length of pattern transferred onto said photosensitive substrate, in a reference direction on said substrate corresponding to said reference direction of the mask;
determining optimum exposure conditions for said projection exposure, from thus measured length of the pattern; and
controlling the exposure according to said conditions.

4,908,657

BOUNDARY DISPLAY DEVICE FOR DIVISION-PRINTING

Mikio Kogane, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 2, 1989, Ser. No. 305,044
Claims priority, application Japan, Feb. 10, 1988, 63-29492
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 **7 Claims**



1. A boundary display device for a photographic printer which has a carrier holding an original and performs division-printing in which the original is nominally divided into a plurality of areas to make a plurality of enlarged partial prints from the original, each of enlarged partial prints corresponding to one area of the nominally divided original, and the carrier having an opening for exposure of division-printing, comprising:
a transparent plate placeable on the original; and
a plurality of lines provided on said transparent plate which represent boundaries of the areas.

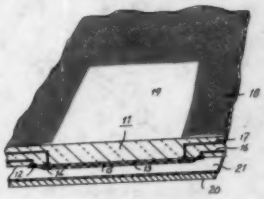
4,908,658

BURN-OUT FRAME FOR A COPY PRINT MACHINE

Lief Lundahl, Stockholm, and Christer Wikstrom, Lidingö, both of Sweden, assignors to Misomex Aktiebolag, Hagersten, Sweden

Filed Sep. 27, 1988, Ser. No. 249,879
Claims priority, application Sweden, Nov. 19, 1987, 87045621
Int. Cl.[4] G03B *27/62, 27/64*
U.S. Cl. 355—76 **7 Claims**

1. Burn-out frame for a copy print machine, said burn-out frame comprising:
a support table on which a film or printing plate is intended to be mounted, said film or printing plate having an image area and a non-image area; and
a copy print frame having an exposure light and one or more original films, said copy print frame providing a print of said one or more original films onto said film or printing plate, each of said one or more original films having an original image area and an original non-image area outside of said original image area;
said copy print frame further comprising a transparent plate, said transparent plate (**11**;**11*a*,11*b***) having a bottom surface, a top surface, an intermediate surface, a clear portion, and a light-diffused portion, said intermediate surface being located between said bottom surface and said top surface,
said bottom surface of said transparent plate being formed with at least one downwardly opening groove (**12**) for vacuum connecting said one or more original films (**13**) to said transparent plate,
said transparent plate also having one or more bores or channels (**16,17**) coupled to said vacuum groove(s) (**12**) for further coupling said vacuum groove(s) (**12**) to vacuum means for providing a vacuum to said vacuum grooves,



said transparent plate (**11**;**11*a*,11*b***) being larger than one of a plurality of predetermined standard sizes of said one or more original films (**13**), and
said clear portion of said transparent plate corresponding in size and location to said original image area of said one or more original films, and said light-diffused portion of said transparent plate being located on said intermediate surface of said transparent plate and corresponding in size and location to said original non-image area of said one or more original films,
whereby said transparent plate allows said non-image area of said film or printing plate to be exposed to light, thus resulting in said non-image area of said film or printing plate being burnt out.

4,908,659

IMAGE-FORMING MACHINE HAVING A COVER MEMBER AND COMPRISING ENGAGING MEANS AND HAMPERING MEANS FOR CONTROLLING CLOSURE OF THE COVER

Yoshifumi Ishii, Neyagawa, and Hiroaki Tsuchiya, Nishinomiya, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

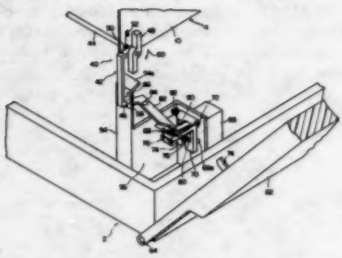
Filed Jul. 6, 1988, Ser. No. 215,518
Claims priority, application Japan, Jul. 10, 1987, 62-170879
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—200 **5 Claims**

1. An image forming machine comprising a supporting structure including a lower supporting frame, an upper supporting frame mounted on the lower supporting frame so as to be free to pivot between an open position and a closed position, locking means for releasably locking the upper supporting frame at the closed position, a cover member mounted on the supporting structure so that it can be opened and closed in order to cover part of the supporting structure, and a detection switch for detecting the closed state of the cover member; in which
the locking means has an engaging member mounted for pivotal movement between a locking position and a releasing position,
the cover member is adapted to be held closed only when the upper supporting frame is at the closed position and the engaging member is at the locking position
an inwardly-projecting, actuating protrusion is provided in

the cover member to move along a path of movement as the cover member is closed,

hampering means is provided in the supporting structure to have a pivotably mounted hampering member and means for pivotably moving the hampering member from a non-operating position to a position within the path of movement of the protrusion,

when the engaging member is at the locking position, the hampering member is held at its non-operating position by



the engaging member so as to permit the cover member to be held closed, and

when the engaging member is pivoted from the locking position toward the releasing position, the moving means pivotably moves the hampering member from its non-operating position into the path of movement of the actuating protrusion, incident to the pivoting movement of the engaging member, so that the actuating protrusion abuts with the hampering member and the cover member is thereby kept from being closed.

4,908,660

IMAGE DUPLICATING APPARATUS HAVING COMPOSITE AND DUPLEX MODES OF OPERATION

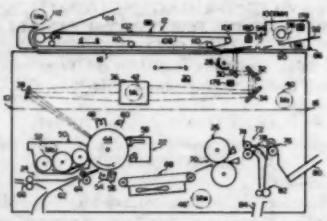
Tadashi Obira, and Syuzi Maruta, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1988, Ser. No. 171,887

Claims priority, application Japan, Mar. 23, 1987, 62-68670

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—206 **18 Claims**



1. An image duplicating apparatus having a mode of copying operation which includes two consecutive cycles, comprising

(a) image reproducing means for reproducing on a copying sheet a visible image duplicated from an original image on a document sheet,

(b) document feed means for automatically feeding a document sheet to and from a position enabling said image reproducing means to reproduce the visible image on a copying sheet,

(c) paper recirculation means for receiving from said image reproducing means the copying sheet on which said visible image has been reproduced during the earlier cycle of copying operation, said paper recirculation means being operative to recirculate the copying sheet toward said image reproducing means during the later cycle of copying operation,

(d) means for detecting a difference between the number of copying sheets received by said paper recirculation means during said earlier cycle of copying operation and the number of copying sheets recirculated from said paper recirculation means during said later cycle of copying operation for producing a signal when said difference is detected upon completion of said two consecutive cycles of copying operation, and

(e) control means responsive to said signal for disabling said document feed means from feeding a document sheet to said position.

4,908,661

HOLDER DEVICE FOR HANDLING AN IMAGE CARRIER OF AN IMAGE FORMING APPARATUS

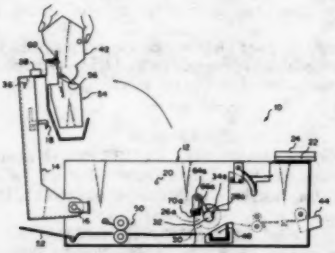
Nobuo Iwata, Sagamihara; Koji Sakamoto, Tokyo, and Misao Tanzawa, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,890

Claims priority, application Japan, Nov. 27, 1987, 62-297783; Nov. 27, 1987, 62-297784; Jun. 9, 1988, 63-140511

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—211 **24 Claims**



1. A holder device for handling an image carrier which is used with an image forming apparatus, comprising:

a housing defining a space for accommodating said image carrier and provided with an open portion for mounting and dismounting said image carrier from said space; and

image carrier support means provided on said housing for detachably supporting said image carrier when said image carrier is accommodated in said housing, wherein said image carrier support means comprises grasping means for grasping and guiding opposite ends of a shaft on which said image carrier is mounted, and retaining means for detachably retaining said opposite ends of said shaft.

4,908,662

AUTOMATIC ORIGINAL FEEDING APPARATUS HAVING AN IMAGE AREA DESIGNATING FUNCTION

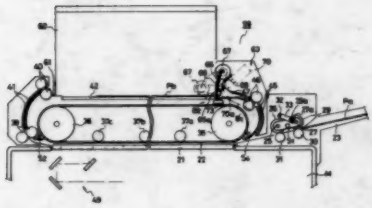
Yasuyoshi Yamamoto, Tokyo; Toshirou Kasamura, Yokohama; Yasunori Maeda, Tokyo; Nobukazu Sasaki, Yokohama; Toshihiko Kusumoto, Tokyo; Naoki Okuda; Tatsuya Shirotori, both of Kawasaki; Takashi Ozawa, Ichikawa; Akiyoshi Kimura; Atsushi Kubota, both of Tokyo; Masashi Ohashi, Tokyo, and Michiro Koike, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

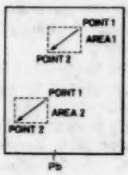
Continuation of Ser. No. 51,369, May 19, 1987, abandoned. This application Sep. 7, 1988, Ser. No. 243,126

Claims priority, application Japan, May 20, 1986, 61-115796; May 20, 1986, 61-115798; May 20, 1986, 61-115799; May 20, 1986, 61-115800

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—218 15 Claims





1. An automatic original feeding apparatus comprising:

original conveying means for introducing an original to a reading position;

a coordinates position detecting device disposed above said original conveying means and provided with a supporting table for supporting thereon a first sheet original with an image surface thereof facing upwardly and having means for designating an area of the first sheet original for image formation;

conveying means for directing the first sheet original along a curved path to said original conveying means;

feed means provided upstream of said conveying means and responsive to the termination of an area designation by said designating means to change over to a feeding condition and feed the first sheet original on said supporting table to said conveying means; and

original supplying means for introducing a second sheet original to said original conveying means with passing through said detecting device and said conveying means.

4,908,663

TONER DENSITY CONTROL AND A BINDING MARGIN BY INDEX BOARD IMAGE

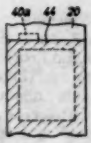
Kouichi Gunji, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed May 12, 1989, Ser. No. 351,160

Claims priority, application Japan, May 13, 1988, 63-117998

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—218 5 Claims



1. An electrophotographic copying machine comprising:

a standard index board disposed adjacent to an original table;

copy mode selecting means for selecting a binding margin copy mode or a normal copy mode;

an optical system for scanning said standard index board, and then scanning said standard index board and an image portion of an original after said optical system returns to a home position in a binding margin copy mode;

a photosensitive body for sequentially forming first and second latent images of said standard index board and a latent image of said image portion of the original thereon in response to light incident from said optical system;

erasing means for erasing the second latent image of said standard index board of the latent images formed on said photosensitive body;

sheet feeding means for feeding a transfer sheet at a timing to form a binding margin at a leading end portion of the transfer sheet; and

toner density control means for adjusting a toner density in accordance with the density of a standard index board image obtained by developing the first latent image of said standard index board.

4,908,664

IMAGE FORMING APPARATUS

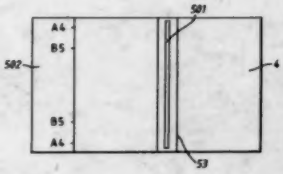
Masahiko Ogura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 168,571, Mar. 7, 1988, abandoned, which is a continuation of Ser. No. 879,192, Jun. 26, 1986, abandoned. This application Apr. 27, 1989, Ser. No. 344,484

Claims priority, application Japan, Jun. 28, 1985, 60-142160

Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—235 5 Claims



1. An image forming apparatus comprising:

an original document table having a transparent glass with two original document holding areas capable of holding first and second original documents in place on said respective holding areas;

a stepping motor having a rotational speed which is con-

trolled by changing the frequency of an electric exciting pulse supplied thereto, rotational steps of said stepping motor being controlled by supplying the electric exciting pulse thereto in a prescribed time;

optical scanning means, operatively connected to said stepping motor to be relatively moved along said original document table, for optically scanning said first and second original documents placed on said original document table and for forming reflected light images thereof;

image forming means for producing visible images on an image forming medium corresponding to said light images; and

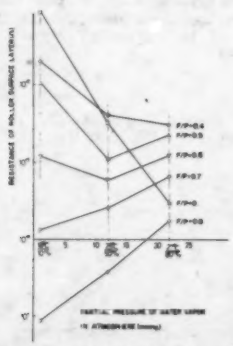
controlling means for controlling said stepping motor: (1) to normally position said optical scanning means at a boundary portion between said first original document and said second original document, (2) to move said optical scanning means in a scanning direction a first prescribed distance comprising a first accelerating section, a first scanning section corresponding to said first original document for scanning said first original document at a constant speed, and a first decelerating section, respectively, by changing the frequency of the electric exciting pulse supplied to said stepping motor and supplying the electric exciting pulse to said stepping motor in the prescribed time, (3) to move said optical scanning means in the scanning direction a second prescribed distance comprising a second accelerating section, a second scanning section corresponding to said second original document for scanning said second original document at a constant speed, and a second decelerating section, respectively, by changing the frequency of the electric exciting pulse supplied to said stepping motor and supplying the electric exciting pulse to said stepping motor in the prescribed time, and (4) to return said optical scanning means to said boundary portion between said first original document and said second original document after the optical scanning of said first and second original documents.

4,908,665

DEVELOPER CARRIER CONTAINING ELECTRICALLY CONDUCTIVE FILLER PRESENT IN A RESIN COATING LAYER FOR USE IN DRY-TYPE IMAGE DEVELOPING DEVICE

Fuchio Takeda, Tokyo; Kazuo Nojima, Numazu, and Yasutaka Nakamura, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,282
Claims priority, application Japan, Feb. 23, 1987, 62-39614
Int. Cl.[4] G03G *15/06, 15/08, 9/08*
U.S. Cl. 355—245 **8 Claims**



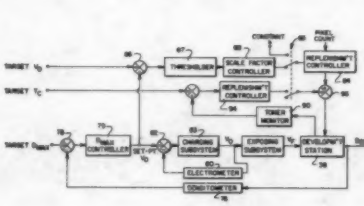
1. A developer carrier for use in a dry-type image developing device having an electrostatic latent image carrier for carrying an electrostatic latent image that can be developed into a visible image by contact with a one-component developer, said developer carrier comprising: a developer carrier body having a circumferential surface; and a resin coating layer mounted on said circumferential surface, said resin coating layer including an electrically conductive filler having a volume average particle diameter which is equal to or less than ½ of the average particle diameter of the developer dispersed therein, and electrically conductive filler being made of a material having a volume resistivity of at most 100 Ω cm.

4,908,666

APPARATUS FOR CONTROLLING TONER REPLENISHMENT IN ELECTROSTATOGRAPHIC PRINTER

William A. Resch, III, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,481
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—246 **19 Claims**



1. An electrostatographic machine comprising:

means for contacting an electrostatic image-bearing member with a development mix of toner and carrier particles, wherein the toner is selectable from a first type which exhibits toning contrast characteristics which vary predictably with changes in the concentration of toner particles in the developer mix and a second type which exhibits unpredictable changes in toning contrast as the toner concentration changes;

means for replenishing the toner in the mix;

means for producing a contrast signal having a value proportional to toning contrast;

means for producing a second signal having a value characteristic of a condition of the development mix; and

means having a first state for actuating replenishment of toner of the first type according to the value of said contrast signal and a second state for actuating replenishment of toner of the second type according to the value of said second signal.

4,908,667

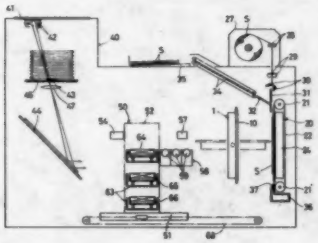
ELECTROPHOTOGRAPHIC COPYING APPARATUS

Hiroo Ikeura; Yoshiyuki Yamaji, both of Wakayama; Hajime Murakami, Kusatsu; Yoshikazu Tamaki, Wakayama, and Ritsuo Tanaka, Osaka, all of Japan, assignors to Noritsu Koki Co., Ltd., Wakayama and Ishihara Sangyo Kaisha, Ltd., Osaka, both of, Japan

Filed Jul. 15, 1988, Ser. No. 219,636
Int. Cl.[4] G03G *15/10, 27/60*
U.S. Cl. 355—256 **2 Claims**

1. An electrophotographic copying apparatus comprising a carrier means for transferring a photosensitive sheet including a reciprocating plate movable between two positions, a rotary shaft rotatably mounted on said reciprocating plate and an exposure table fixedly mounted on said rotary shaft and adapted to suck and support said photosensitive sheet, a conveyor means provided near one of said two positions and including an endless suction belt for feeding said photosensitive sheet up and down, said conveyor means being a dated to exchange said photosensitive sheet between said suction belt

and said exposure table by turning on and off suction force with said photosensitive sheet sandwiched therebetween, a corona charging means for electrostatically charging said photosensitive sheet disposed in the path of travel of said carrier means, a light exposure means disposed near the other



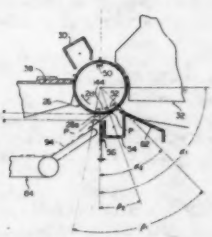
of said two positions and adapted to irradiate the photosensitive sheet on said exposure table which is held in an upright position with light reflected by an original, and a developing means for bringing the photosensitive sheet exposed to light into contact with a developing solution.

4,908,668

IMAGE-FORMING MACHINE

Junichi Takamatsu, Osaka, and Kazunori Akiyama, Suita, both of Japan, assignors to Mita Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 50,438, May 18, 1987, Pat. No. 4,829,334.
This application Dec. 15, 1988, Ser. No. 284,693
Claims priority, application Japan, May 28, 1986, 61-79541; Oct. 13, 1986, 61-242597; Nov. 28, 1986, 61-281698
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—274 **3 Claims**



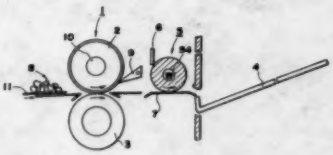
1. An image-forming machine comprising a rotatable drum having an electrophotographic material on its peripheral surface, means defining in sequence an electrostatic latent image-forming zone for forming a latent electrophotographic material, a developing zone for developing the latent electrostatic image to a toner image, a transfer zone for transferring the toner image to a sheet material, and a peeling zone for peeling the sheet material from the electrophotographic material, said zones being arranged along the peripheral surface of the rotating drum in said sequence as viewed in the rotational direction of the rotatable drum, a charge eliminating device disposed in the peeling zone so as to be positioned opposite to the peripheral surface of the rotatable drum, means defining a conveying passage extending at substantially the same level as, or below, the lowermost site of the rotatable drum, the sheet material peeled from the peripheral surface of the rotatable drum in the peeling zone during rotation of said drum being conveyed through said conveying passage, the transfer zone being arranged in a region within an angle, α, of from −90 degrees to 0 degrees from said lowermost site with respect to the rotational direction of the rotatable drum, and the peeling zone being arranged in a region within an angle, β, of from −45 degrees to 0 degrees from said lowermost site with respect to the rotational direction of the rotatable drum, the transfer zone preceding the peeling zone with respect to the rotational direction of the rotatable drum, while avoiding overlapping of the peeling zone and the transfer zone.

4,908,669

TONER IMAGE TREATMENT DEVICE FOR USE IN ELECTROSTATIC COPYING MACHINES

Masaaki Yamamoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1988, Ser. No. 258,859
Claims priority, application Japan, Oct. 21, 1987, 62-266868
Int. Cl.[4] G03G *15/20, 8/00*
U.S. Cl. 355—282 **15 Claims**



1. A toner image treatment device for use in electrostatic copying machines with a fixing device which fixes a toner image onto a copy sheet, comprising:

a rotatable porous roller disposed downstream from the fixing device and being impregnated with a transparent resin which is a solid at room temperature and a liquid at a high temperature;

a heat source disposed in the interior of said porous roller to melt the transparent resin; and

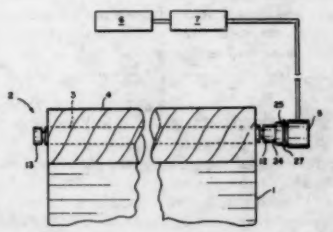
a member for bringing the copy sheet passed through the fixing device into contact with said porous rollers, whereby the toner image on the copy sheet is coated with the transparent resin.

4,908,670

WICK FOR FIXING ROLLER

Sylvain L. Ndebi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,626
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—284 **13 Claims**



1. A wick structure for use in a fixing device, the fixing device being of the type having a fixing surface to which release liquid is to be applied, a source for such release liquid, a feed means, and means for transporting such liquid through the feed means, said wick structure comprising:

a disposable feed tube connectable to an end of said feed means, said tube containing small slits through which said

liquid can pass, said slits having a long dimension parallel to the wick axis, and

a soft porous capillary material surrounding said feed tube.

4,908,671

CLEANING DEVICE FOR AN IMAGE RECORDER

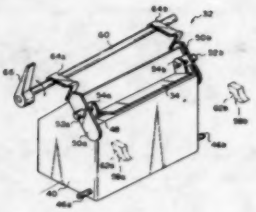
Hiroshi Kusumoto, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 11, 1989, Ser. No. 295,739

Claims priority, application Japan, Feb. 16, 1988, 63-18895[U]

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—298 **4 Claims**



1. A cleaning device for use in an image recorder for removing toner which remains on a photoconductive element of said image recorder, comprising:

a tank for toner collection, said tank having stubs individually provided on opposite ends of said tank for supporting said tank on a frame which also supports a photoconductive element;

a cleaning blade positionable to extend along an axis of the photoconductive element and having an operating edge for scraping a remaining toner off the photoconductive element and thereby collecting the toner in said tank;

a blade holder member holding said cleaning blade;

a pair of holder support members individually securely mounted on the opposite ends of said tank and supporting opposite end portions of said blade holder member at inner surfaces of said holder support members, said blade holder member being rotatable about shafts which extend inward from the inner surfaces of said holder support members; and

a pair of pins extending outward from outer surfaces of said holder support members and coaxially aligned with said shafts for, when said tank is rotated toward the photoconductive element, individually engaging with retaining members which are securely mounted on the frame so as to retain said tank in position,

whereby said cleaning blade is accurately positioned relative to the photoconductive element by the coaxial alignment of said shafts and said pins.

4,908,672

PAPER SIZE SELECTION APPARATUS FOR USE IN COPIER MACHINES

Masazumi Ito, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 5, 1988, Ser. No. 152,546

Claims priority, application Japan, Jun. 5, 1987, 62-141874

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—311 **8 Claims**

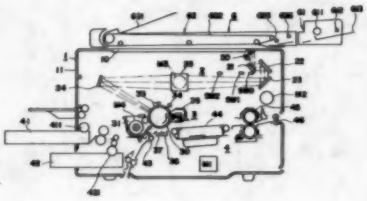
1. A paper size selecting apparatus for use in copier machines having a plurality of copier paper accommodating sections each of which accommodates papers of different size, said paper size selecting apparatus comprising:

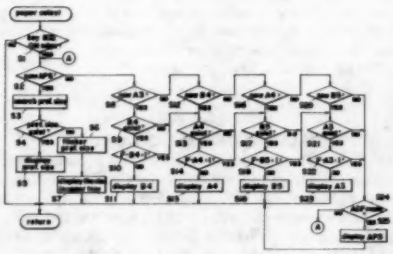
means for automatically determining a paper size to be used for copying based on the size of a document to be copied and a selected magnification factor;

first means for selecting one of said paper accommodating sections according to the determining means;

means for designating a paper size to be preferentially utilized;

second means for selecting the paper accommodating section in which papers of the size designated by said designating means are accommodated;





third means for selecting one of said paper accommodating sections in which papers of a size different from the paper size designated by said designating means are accommodated;

a key for inputting an instruction to the third selecting means as to paper size selection; and

means for causing one of the first, second and third selecting means to be progressively operable in this order in response to each manipulation of the key.

4,908,673

IMAGE FORMING APPARATUS HAVING A PAPER REFEED TRAY

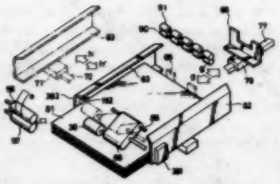
Hideo Muramatsu, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 19, 1988, Ser. No. 259,781

Claims priority, application Japan, Oct. 19, 1987, 62-263210; Oct. 19, 1987, 62-263211; Oct. 19, 1987, 62-263212; Oct. 19, 1987, 62-263213

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—311 **14 Claims**



1. An image forming apparatus which feeds to a paper refeed tray and stores therein, paper having one surface where an

image is formed by an image forming portion and refeeds the paper from said paper refeed tray to said image forming portion to form an image on the same surface or the opposite surface of said paper, comprising:

regulation means for regulating edges of paper stored in said paper refeed tray, said regulation means having regulator members movable in opposite directions toward and away from the stored paper,

drive means for moving said regulator members in the opposite directions,

detection means provided in said regulator members for detecting contact of each said regulator member with an edge of paper stored in said paper refeed tray to generate a signal, and

control means for moving said regulator members away from said paper refeed tray at the time of storing paper in said paper refeed tray, moving said regulator members toward the paper after the paper is stored, and stopping said regulator members in response to the signal from said detection means.

4,908,674

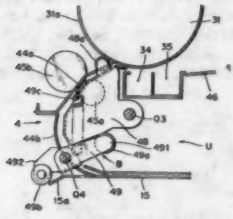
IMAGE FORMING APPARATUS

Masahiko Fukano, Osaka, and Mitsutoshi Takemoto, Yao, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 22, 1989, Ser. No. 313,611

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—318 **8 Claims**



1. An image forming apparatus comprising:

a paper delivery section for guiding paper delivered from a paper feed section, to a space between a photoreceptor and a transferring corona discharger, said paper being guided as turned over after having passed between a pair of arcuate reversing guides,

a portion of said paper delivery section being formed as a unit which can be integrally pulled out from the body of said apparatus,

the inner reversing guide out of said pair of reversing guides being attached to said unit at a predetermined position thereof so as to be movable between an original position in the vicinity of said photoreceptor and a retreat position which is lower than said original position and at which said inner reversing guide does not come into collision with said photoreceptor when said unit is pulled out; and

guide lifting and lowering means adapted to retreat said inner reversing guide from said original position to said retreat position in association with a unit pulling operation, and adapted to return said inner reversing guide from said retreat position to said original position in association with a unit insertion operation.

4,908,675

COLOR IMAGE FORMING APPARATUS HAVING A SYNCHRONIZED CONVEYOR

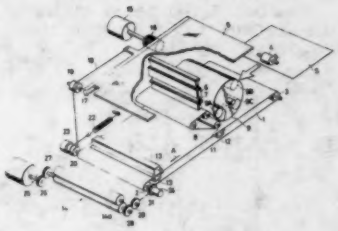
Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 12,486, Feb. 9, 1987, abandoned. This application May 16, 1988, Ser. No. 195,459

Claims priority, application Japan, Feb. 10, 1986, 61-17931; Feb. 10, 1986, 61-27709; Aug. 20, 1986, 61-194858

Int. Cl.[4] G03G *15/01, 15/28, 21/00*

U.S. Cl. 355—326 **3 Claims**



1. An image forming apparatus comprising:

an image forming system for forming an image of a document;

an image transfer device for transferring the image from said image forming system onto an image transfer sheet;

an endless conveyor belt extending in a direction for conveying the image transfer sheet to said image transfer device;

an image forming system driving system for reciprocally moving a portion of said image forming system along said direction;

an image fixing device disposed at an outlet end of said endless conveyor belt for fixing the transferred image to said image transfer sheet;

a fixing device driving system for driving said image fixing device;

a first transmission system for transmitting driving power from said image forming system driving system to said conveyor belt at a first speed to operate the conveyor belt in synchronism with said image forming system; and

a second transmission system for transmitting driving power from said fixing device driving system to said conveyor belt to operate the conveyor belt at a second speed in synchronism with said fixing device driving system,

said first transmission system being actuatable when the image is being transferred from said image forming system onto the image transfer sheet, and said second transmission system being actuatable when the image is being fixed to the image transfer sheet,

wherein said image forming system comprises:

a photosensitive body;

means for exposing said photosensitive body to successive images in different colors in a color separation operation, thereby to form latent images successively on said photosensitive body; and

means for developing said latent images successively into visible images of different colors;

wherein said conveyor belt comprises means for conveying said image transfer sheet in successive reciprocating strokes to allow the visible images to be successively transferred from said photosensitive body onto said image transfer sheet in synchronization with the respective reciprocating strokes;

wherein said first transmission system is capable of shutting off transmission of driving power while said portion of said image forming system is moving for a distance corresponding to a period of time from after the portion of said

image forming system starts moving and said photosensitive body starts being exposed to until the image starts being transferred from said photosensitive body onto said image transfer sheet, and thereafter of driving said conveyor belt in synchronism with said portion of said image forming system.

4,908,676

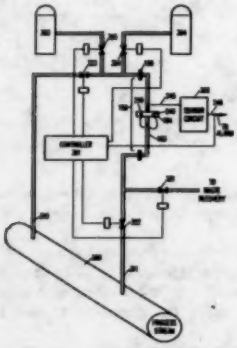
SENSORS FOR DISSOLVED SUBSTANCES IN FLUIDS

Glenn W. Bedell; Benjamin Greene; Marion Davis, all of Las Cruces, and Floyd J. Abbott, Hobbs, all of N. Mex., assignors to Bio-Recovery Systems, Inc., Las Cruces, N. Mex.

Filed Dec. 18, 1987, Ser. No. 135,126

Int. Cl.[4] G01N *21/47, 21/59, 21/64, 21/85*

U.S. Cl. 356—72 **80 Claims**



1. A method for monitoring the amount of a selected analyte in a process stream comprising:

withdrawing a side stream from said process stream;

passing said side stream through a column containing an adsorbent wherein said adsorbent adsorbs said selected analyte and further wherein said adsorbed selected analyte has an extinction coefficient such that said adsorbed selected analyte absorbs detectable electromagnetic energy;

shining a beam of electromagnetic radiation, having a wavelength absorbed by said adsorbed selected analyte, at a selected location on said column;

choosing said selected location based upon the amount of said selected analyte and a predetermined sampling period wherein for said predetermined sampling period, said selected location is moved away from an inlet of said column and toward an outlet of said column as said monitored amount of said selected analyte is increased; and

measuring the level of electromagnetic radiation from said selected location on said column containing said adsorbent as said side stream passes through said column.

4,908,677

METHOD OF EXAMINING THE STATES OF ALIGNMENT OF GLASS FIBERS OF A PAIR OF RIBBON FIBER CABLES

Tsutomu Onoders, and Takeshi Yamada, both of Sakura, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,625

Claims priority, application Japan, Aug. 14, 1987, 62-202942; Aug. 14, 1987, 62-202943

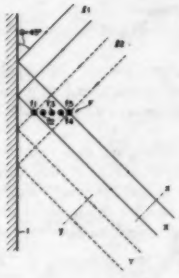
Int. Cl.[4] G01B *11/27*; G01N *21/84*

U.S. Cl. 356—73.1 **11 Claims**

1. A method of examining the states of alignment of glass fibers contained, respectively, in a pair of ribbon fiber cables by observing their images obtained in two directions, said method comprising:

locating a reflecting mirror adjacent to glass fibers of a pair of ribbon fiber cables which are to be connected with each other,

introducing illuminating light into the glass fibers of the fiber cables in a direction different from a direction normal to a plane formed by the glass fibers; and



observing for each glass fiber an image formed by the illuminating light which is reflected by the reflecting mirror and then passed through an individual glass fiber and another image formed by the illuminating light which is passed through the individual glass fiber and then reflected by the reflecting mirror.

4,908,678

FET WITH A SUPER LATTICE CHANNEL

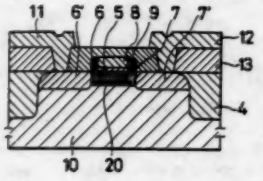
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1987, Ser. No. 102,841

Claims priority, application Japan, Oct. 8, 1986, 61-240544; Oct. 8, 1986, 61-240545; Oct. 8, 1986, 61-240546

Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—4 **15 Claims**



1. An electronic device comprising:

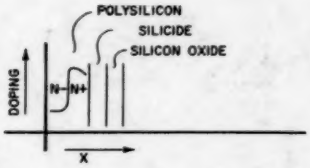
a substrate within which first and second impurity regions and a superlattice structure between said first and second impurity regions are formed where the superlattice structure has upper and lower surfaces extending between the first and second impurity regions; and

wherein the impurity densities of said first and second impurity regions are greater at a lower level beneath the upper surface of the superlattice structure than at a said upper surface of the superlattice structure so that the length of the superlattice structure between the first and second impurity regions is less at said lower level than at said upper surface of the superlattice structure in order to define a low resistance inner channel within the superlattice structure between the first and second impurity regions.

4,908,679
LOW RESISTANCE SCHOTTKY DIODE ON POLYSILICON/METAL-SILICIDE

Madhukar B. Vora, Los Gatos, and Hemraj K. Hingarh, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 227,837, Jan. 23, 1981, abandoned. This application Jan. 12, 1984, Ser. No. 570,408
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 3 Claims



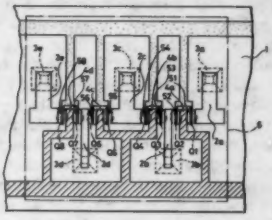
1. An integrated Schottky diode structure comprising:
a first dielectric layer of electrically insulating material;
a metal silicide layer disposed on the dielectric layer;
a polycrystalline silicon layer disposed on the metal silicide layer, a lower portion of the polycrystalline silicon layer being doped with N conductivity type impurity to provide an ohmic connection to the metal silicide layer;
a monocrystalline silicon layer disposed on the polycrystalline silicon layer, an upper portion of the monocrystalline silicon being doped with N conductivity type material to a lower concentration than the underlying polycrystalline silicon layer, at least one selected region of the monocrystalline silicon layer being doped with more N conductivity type impurity than the surrounding monocrystalline silicon layer;
a second dielectric layer of electrically insulating material disposed on the monocrystalline silicon layer, the second dielectric layer having a plurality of openings therein, each of said openings extending through the electrically insulating material to expose underlying monocrystalline silicon, at least one of the openings being aligned with the at least one selected region of the monocrystalline silicon layer having more N conductivity type impurity; and
a plurality of metal connections to the monocrystalline silicon ohmically isolated from each other and positioned in the openings in the second dialectric layer to form anodes of the integrated diode structure, with the metal silicide layer forming a common cathode for all of the anodes.

4,908,680
SEMICONDUCTOR INTEGRATED CIRCUIT

Hiroshi Matsuoka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 26, 1988, Ser. No. 224,294
Claims priority, application Japan, Jul. 28, 1987, 62-189379
Int. Cl.[4] H01L *29/80, 23/48, 29/06*
U.S. Cl. 357—22 3 Claims

1. A semiconductor integrated circuit device comprising:
a semiconductor substrate containing via-holes;
a plurality of transistors, each including a source region and a drain region disposed on said semiconductor substrate and a gate region disposed between said source region and said drain region wherein the via-holes are disposed in said substrate at said source regions, said source regions of said transistors are commonly connected to each other through the via-holes , said gate and drain regions of said transistors are respectively commonly connected to each other on said semiconductor substrate, the via-holes in said semiconductor substrate are arranged in two dimensions in said semiconductor substrate, each of the via-holes lies along one of first and second generally parallel straight lines, and each pair of via-holes, consisting of one via-hole lying along the first line and one via-hole lying

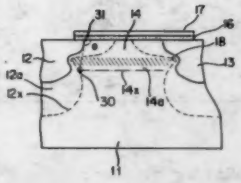


along the second line, lies on a straight line that is oblique to the first and second lines.

4,908,681
INSULATED GATE FIELD EFFECT TRANSISTOR WITH BURIED LAYER

Masanori Nishida, Ota; Masashige Aoyama, and Hiroshi Onodera, both of Gunma, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 569,926, Jan. 11, 1984, abandoned, which is a continuation of Ser. No. 258,992, Apr. 30, 1981, abandoned. This application Oct. 27, 1988, Ser. No. 265,338
Claims priority, application Japan, Apr. 30, 1980, 55-58070
Int. Cl.[4] H01L *29/78, 29/90*
U.S. Cl. 357—23.3 4 Claims



1. A short channel insulated gate field effect transistor having a deep ion implantation layer, said transistor comprising:
(a) a substrate of semiconductor material of a first conductivity type, having a major surface;
(b) a source region of a second conductivity type opposite in polarity to the first conductivity type, the source region being formed in and extending under the major surface;
(c) a drain region of the second conductivity type, formed in and extending under the major surface, the drain region being separated from the source region by the substrate material;
(d) a channel region in the substrate situated between the source and drain regions, the channel region comprising a gate depletion region and a channel layer, wherein current flows through the channel layer;
(e) a gate electrode positioned above the channel region and extending on a gate insulator film formed on the major surface of at least the channel region;
(f) a source depletion layer and said gate depletion layer being formed in the substrate by the electric fields of the source region and the gate electrode;
(g) a source depletion boundary defined between the substrate and the source depletion layer in the absence of a back gate voltage on the substrate;
(h) a gate depletion boundary defined between the substrate and maximum depletion layer formed in the substrate in the absence of the back gate voltage; and
(i) a deep ion implanted layer of the first conductivity type

formed in a deep portion of the channel region, wherein the gate depletion boundary is located in the deep ion implanted layer and the density of the deep ion implanted layer is such that a recessed portion is defined in the source depletion boundary, the recessed portion extending towards the source region;

(j) wherein the angle θ formed between the surface of the substrate and an imaginary line extending from the junction of the source region and the channel region on the surface of the substrate to the intersection of the gate depletion boundary and the source depletion boundary is greater than 90° whereby the intersection of the gate depletion boundary and the source depletion boundary is displaced towards the source side of an imaginary line perpendicular to the major surface, the imaginary line passing through the junction of the source region and the channel region on the surface of the substrate.

4,908,682

POWER MOSFET HAVING A CURRENT SENSING ELEMENT OF HIGH ACCURACY

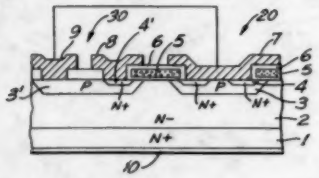
Mitsuasa Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 17, 1989, Ser. No. 339,486

Claims priority, application Japan, Apr. 19, 1988, 63-97202

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **6 Claims**



1. A MOS field effect transistor comprising:

a drain region of one conductivity type;

a plurality of first base regions of the opposite conductivity type formed in one principal surface of said drain region;

a plurality of first source regions of said one conductivity type formed in said first base regions;

a first gate electrode formed over first portions of said first base regions, said first portions being sandwiched between said first source regions and said drain region;

a source electrode connected commonly with said plurality of first base regions and said plurality of first source regions;

a second base region of said opposite conductivity type formed in said one principal surface of said drain region;

a second source region of said one conductivity type formed in said second base region;

a second gate electrode formed over a second portion of said second base region, said second portion being sandwiched between said second source region and said drain region, said second gate electrode being electrically connected with said first gate electrode;

a base electrode electrically connected with said second base region and said first source electrode, said base electrode being not connected with said second source region;

a current leading-out electrode electrically connected with said second source region, said current leading-out electrode being not connected with said second base region; and

a drain electrode electrically connected with said drain region.

4,908,683

TECHNIQUE FOR ELIMINATION OF POLYSILICON STRINGERS IN DIRECT MOAT FIELD OXIDE STRUCTURE

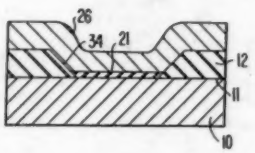
Dyer A. Matlock, Melbourne; Richard L. Lichtel, Jr., and Lawrence G. Pearce, both of Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 841,297, Mar. 19, 1986, Pat. No. 4,702,000.

This application Aug. 11, 1987, Ser. No. 84,556

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.11 **2 Claims**



1. A semiconductor device comprising:

a semiconductor body having a planar surface;

an insulator layer disposed on said planar surface of said semiconductor body and having an aperture therein defining a sidewall of said insulator layer and exposing a portion of said planar surface of said semiconductor body;

a layer of conductive material extending from the top surface of said insulator layer into the aperture therein so as to overlie a portion of the exposed planar surface of said semiconductor body; and wherein

that portion of the sidewall of said insulator layer defining said aperture over which said layer of conductive material extends has a tapered thickness to said planar surface, such that the thinnest portion of the tapered sidewall of said insulator layer is at the planar surface of said semiconductor body, and that portion of the sidewall of said insulator layer other than that portion of the sidewall of said insulator layer over which said layer of conductive material extends is effectively vertical with respect to said planar surface, and further including a thin dielectric layer disposed on said portion of the exposed planar surface of said semiconductor body over which said layer of conductive material lies, said layer of conductive material being contiguous with the tapered thickness portion of the sidewall of said insulator layer and with the top surface of said dielectric layer, and further comprising insulator spacers disposed on the planar surface of said substrate exposed by the aperture in said insulator layer so as to be contiguous with the vertical sidewall of said insulator layer and sidewall of said layer of conductive material.

4,908,684

SOLID-STATE IMAGING DEVICE

Norio Koike, Tokyo; Toshifumi Ozaki, Koganei; Masaaki Nakai, Tokorozawa; Haruhisa Ando, Tokyo; Shinya Ohba, Kanagawa; Hideyuki Ono, Kokubunji; Hajime Akimoto, Hachioji, and Hajime Kinugasa, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Ltd., Mobara, both of, Japan

Filed Jul. 7, 1987, Ser. No. 70,552

Claims priority, application Japan, Jul. 7, 1986, 61-157820; Jul. 11, 1986, 61-161832; Nov. 12, 1986, 61-267653

Int. Cl.[4] H01L *29/78, 27/14, 31/00*; G11C *19/28*

U.S. Cl. 357—24 **9 Claims**

1. A solid-state imaging device comprising:

a semiconductor body;

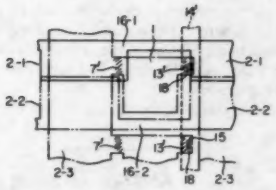
a plurality of photoelectric conversion elements formed on said semiconductor body and arranged in horizontal and vertical directions;

a plurality of vertical charge transfer devices which verti-

cally transfer charge and which are composed of a plurality of sets of at least first and second electrodes;

a plurality of transfer gates through which signal charge produced in each said photoelectric conversion elements in response to incident light is transferred to a channel beneath a predetermined electrode of said vertical charge transfer devices;

a horizontal charge transfer device by which the signal charges delivered from said vertical charge transfer devices are horizontally transferred; and



an overflow transistor provided in an isolation region lying between one of said photoelectric conversion elements and one of said vertical charge transfer devices for discharging externally excess charge produced upon incidence of light having high intensity, said overflow transistor having a gate thereof comprised of a portion of a third electrode disposed in said isolation region, and wherein a drain of the overflow transistor and the gate of the overflow transistor are electrically coupled to each other so as to reduce a required area of the overflow transistor.

4,908,685

MAGNETOELECTRIC TRANSDUCER

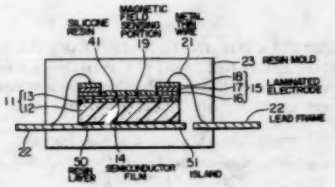
Ichiro Shibasaki, Fuji, and Takashi Kajino, Narashino, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 948,053, Dec. 31, 1986. This application Mar. 15, 1989, Ser. No. 325,129

Claims priority, application Japan, May 10, 1985, 60-99395; May 10, 1985, 60-99396; May 24, 1985, 60-110155

Int. Cl.[4] H01L *27/22*

U.S. Cl. 357—27 **8 Claims**



1. A compound semiconductor magnetoelectric transducer comprising:

a substrate and an organic insulating layer overlaying said substrate;

a group III-V compound semiconductor layer of 0.1 to 10μm thickness disposed on said substrate and having a predetermined pattern to provide a magnetic field sensing portion;

a plurality of electrodes each formed of a laminated stack of three metal layers;

the first metal layer of said laminated stack being continuous to and in ohmic contact with said semiconductor layer and made of a material selected from the group consisting of Cu, Au, Au alloys and Au-Ge alloys;

the intermediate layer of said laminated stack providing a mechanical strength above a predetermined value and being formed on said first metal layer and made of a material selected from the group consisting of Ni, Cu and their alloys;

the third layer of said laminated stack being provided for wire bonding and being formed on said intermediate layer and made of Au; and

said first metal layer, said intermediate metal layer and said third layer each having a thickness of between about 2–5 μm.

4,908,686

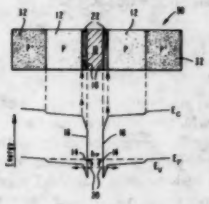
STACKED SILICIDE/SILICON MID- TO LONG-WAVELENGTH INFRARED DETECTOR

Joseph Maserjian, Goleta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Aug. 1, 1988, Ser. No. 226,754

Int. Cl.[4] H01L *29/48, 31/10, 27/14*

U.S. Cl. 357—30 **10 Claims**



1. An improved infrared detector comprising at least one unit comprising a thin single crystal metal silicide layer sandwiched between two single crystal silicon layers, each doped to a first doping level, each said silicon layer forming an interface with said silicide layer, the improvement comprising that portion of each said silicon layer adjacent said interface having a second doping level higher than that of said first doping level, thereby forming a reduced Schottky barrier.

4,908,687

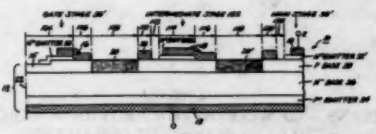
CONTROLLED TURN-ON THYRISTOR

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 119,283, Oct. 30, 1987, abandoned, which is a continuation of Ser. No. 857,201, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 626,165, Jun. 29, 1984, abandoned. This application Feb. 2, 1989, Ser. No. 306,251

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 **22 Claims**



1. A multistage amplifying thyristor comprising:

a semiconductor body comprising a first emitter layer, a first base layer atop said first emitter layer, a second base layer atop said first base layer, a first stage emitter layer atop said second base layer, and a second stage emitter layer atop said second base layer spaced from said first stage emitter layer in a direction of turn on sequence by a portion of said second base layer, said first stage emitter layer having a first edge at its edge toward said second stage emitter layer;

a first emitter electrode underlying said first emitter layer and in ohmic contact therewith;

a first stage emitter electrode in a first part overlying said first stage emitter layer and in a second part, situated toward said second stage emitter layer from said first part and in ohmic contact with said second base layer, said first stage emitter electrode having a first edge on its side toward said second stage emitter layer;

a second stage emitter electrode in ohmic contact with said second stage emitter layer, said second stage emitter layer having a first edge on its side toward said first emitter layer;

a current control resistor region constituting a portion of said second base region defined on a first side by a projection of said first edge of said first stage emitter electrode onto said second base and on a second side by a projection of said first edge of said second stage emitter layer onto said second base region;

said current control resistor region having an unmodulated resistance selected to limit to a safe level the turn-on current in each preceding amplifying thyristor stage and having a resistance value R_G of:

$$R_G \geq 0.5 V_G^2 \Delta t_G / C_h \gamma_G (\Delta T_{MAX})$$

wherein V_G is the maximum rated voltage of the device, Δt_G is the time during which turn-on current flows through the resistor, C_h is the specific thermal capacity of the semiconductor, γ_G is the volume of the semiconductor in which the turn-on current for this resistor flows and ΔT_{MAX} is the maximum permissible temperature rise in this turn-on volume of the semiconductor;

said first edge of said first stage emitter electrode extending beyond said first edge of said first stage emitter layer toward second stage emitter layer by a predetermined distance of at least the greater of either one thickness of said semiconductor body or two ambipolar diffusion lengths in said first base layer from at least one of:

an edge of said first stage emitter layer which is on the side of said first stage emitter layer which is away from said second stage emitter layer;

a first edge of the location occupied by the turn-on plasma beneath said first stage emitter layer during device turn-on, where said first edge of said turn-on plasma is toward said second stage emitter layer; and

said first edge of said first stage emitter layer.

4,908,688

MEANS AND METHOD FOR PROVIDING CONTACT SEPARATION IN SILICIDED DEVICES

Clarence A. Lund, Phoenix, and Richard R. Hamzik, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 839,848, Mar. 14, 1986, Pat. No. 4,753,897. This application Dec. 14, 1987, Ser. No. 132,822

Int. Cl.[4] H01L *27/02, 27/78, 27/12*

U.S. Cl. 357—41 **5 Claims**

1. An MOS device structure comprising:

a semiconductor substrate of a first conductivity type having therein a first part for containing an MOS device;

an isolation means substantially laterally surrounding the first part of the substrate and having first and second opposed portions joined by third and fourth opposed portions;

a first doped region of a second, opposite, conductivity type, located in the first part extending between the first and second portions of the lateral isolation means;

a second doped region of the second conductivity type, located in the first part separated from the first doped region by a channel region and extending between the first and second portions of the lateral isolation means;

an active gate on an insulator and self-aligned above the channel region;

a third doped region of the first conductivity type, located in the first part separated from the first doped region by an electrically inactive region and extending between the first and second portions of the lateral isolation means;

an inactive gate on an insulator and self-aligned above the inactive region; and

an electrode shorting the inactive gate and the third doped region.

4,908,689

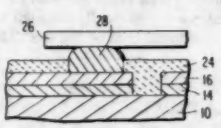
ORGANIC SOLDER BARRIER

Donald G. McBride, Binghamton, N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation

Continuation of Ser. No. 860,261, May 6, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 213,434

Int. Cl.[4] H01L *23/14, 23/18, 23/12*

U.S. Cl. 357—67 **6 Claims**



1. An electrical connection between a semiconductor chip and a carrier, comprising:

a reflow solder ball contacting said chip and said carrier; and

a positive photoresist layer comprising a reaction product of a polymeric material containing reactive hydrogen with a silyl group containing multifunctional organometallic material, said layer surrounding said solder ball on the surface of said carrier to act as a solder dam.

4,908,690

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH HIGH RELIABILITY WIRING LAYERS

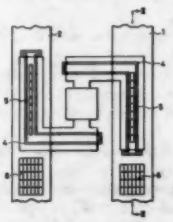
Masayuki Hata, and Hiromasa Nakagawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,880

Claims priority, application Japan, Oct. 29, 1986, 61-259020

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—68 **12 Claims**



1. A semiconductor integrated circuit device including a

semiconductor substrate **10**, an insulating layer **12** formed thereon and having a plurality of contact holes **16** and bulk contact holes **17** and a wiring portion **7,8** formed on said insulating layer **12** and extending in a direction, comprising at least a MOS field effect transistor having a source **18** and a drain **19** both formed in said substrate **10** and a gate **5** formed between said substrate and said wiring portion and extending substantially in parallel with the direction of said wiring portion.

4,908,691

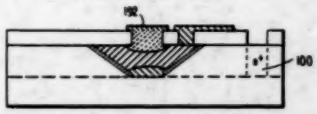
SELECTIVE EPITAXIAL GROWTH STRUCTURE AND ISOLATION

Victor J. Silvestri, Hopewell Junction, and Paul J. Tsang, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 793,612, Oct. 31, 1985, Pat. No. 4,728,624. This application Oct. 9, 1987, Ser. No. 106,210

Int. Cl.[4] H01L *29/12*

U.S. Cl. 357—49 **15 Claims**



1. An array of integrated circuit devices, comprising:

a monocrystalline silicon substrate having an upper and lower portion, said upper portion being doped in accordance with types of devices being formed, said lower portion forming subcollectors for said devices, said substrate having a plurality of trenches formed therein, said trenches extending through said upper portion into said lower portion;

an oxide layer formed in each of said trenches, each said oxide layer having an opening to said lower portion of said substrate;

epitaxial silicon filling each of said trenches;

a first plurality of active device elements formed in said epitaxial silicon, said first plurality of active device elements being appropriately doped so as to form a plurality of P-N junctions between adjacent ones of said first plurality of active device elements, said P-N junctions between said active device elements having equal areas, and being vertically aligned with each said opening, a first plurality of devices thereby being formed; and

a second plurality of active device elements formed in said upper portion of said substrate between consecutive ones of said trenches, said second plurality of active device elements forming a second plurality of devices complementary in type to said first plurality of devices.

4,908,692

FUSE-CONTAINING SEMICONDUCTOR DEVICE

Kouji Kikuchi, Kawasaki, and Kazuo Endo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 32,527, Apr. 1, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 302,142

Claims priority, application Japan, Jun. 20, 1986, 61-142679

Int. Cl.[4] H01L *29/06, 27/02, 23/48*

U.S. Cl. 357—51 **8 Claims**

1. A semiconductor device having a fuse, which device comprises:

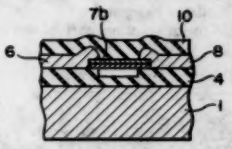
a semiconductor substrate;

an insulating layer provided on said semiconductor substrate;

at least two wiring layers separately formed on said insulating layer; and

a fuse provided on said insulating layer for connecting the two wiring layers;

wherein said fuse includes a composite body formed of a first layer of a metal silicide including a metal component, and a second layer prepared from metal material corresponding to the metal component and provided on said first layer.



4,908,693

WIRING STRUCTURE OF SEMICONDUCTOR PRESSURE SENSOR

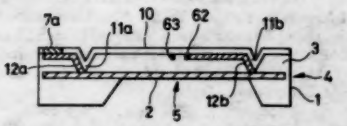
Masanori Nishiguchi, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 8, 1987, Ser. No. 130,323

Claims priority, application Japan, Dec. 8, 1986, 61-292082; Dec. 8, 1986, 61-292083; Dec. 8, 1986, 61-292084

Int. Cl.[4] H01L *23/48, 29/84, 29/06; G01L 9/06*

U.S. Cl. 357—68 **6 Claims**



1. A semiconductor pressure sensor, comprising:

a sensor chip including an etching stop layer of high concentration impurity ions formed by ion implantation of impurity ions into a substrate of silicon single crystal or by deposition and diffusion, and an epitaxial growth layer of silicon single crystal on said etching stop layer;

a recess formed in the back of said sensor chip through etching;

circuit elements formed on said sensor chip;

diffusion lead portions for wiring said circuit elements;

first connecting regions, each formed between said etching stop layer and a first predetermined position on the surface of said sensor chip; and

first diffusion regions, each formed between said first predetermined position and one of terminals of said circuit elements.

4,908,694

SEMICONDUCTOR DEVICE

Norio Hidaka; Shigeyuki Yamamura, both of Sagamihara, and Masumi Fukuta, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP83/00129, § 371 Date Dec. 20, 1983, § 102(e) Date Dec. 20, 1983, PCT Pub. No. WO83/03922, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 26, 1983, Ser. No. 571,542

Claims priority, application Japan, Apr. 30, 1982, 57-73080

Int. Cl.[4] H01L *23/02, 23/12*

U.S. Cl. 357—74 **7 Claims**

1. A device for an electronic device, comprising:

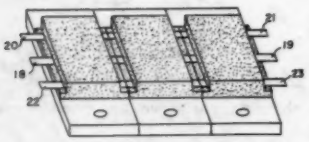
a solid metal base having a solid metal case and a through-passage connecting the inside and outside of said metal case, the metal case for accommodating the electronic device;

an electric terminal in the through hole, said electric terminal comprising:

an insulator base having a planar surface;

a strip line conductor layer formed on the planar surface of said insulator base; and

an insulator piece abutting part of the planar surface of



said insulator base, an upper surface of said strip line conductor layer being exposed on both sides of said insulator piece and the exposed portion being provided on the inside and outside of said metal case, and the electronic device being connectable to the exposed portion of said strip line conductor on the inside of said metal case.

4,908,695

COOLING APPARATUS AND SEMICONDUCTOR DEVICE EMPLOYING THE SAME

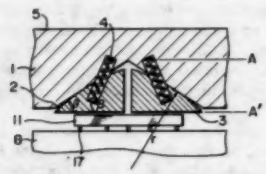
Atsushi Morihara, Katsuta; Yoshio Naganuma, Hitachi; Shuntaro Koyama, Katsuta; Kazuji Yamada, Hitachi; Tasao Soga, Hitachi; Hideo Arakawa, Hitachi; Shunsuke Nogita, Hitachi, and Yukio Hishinuma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,650

Claims priority, application Japan, Apr. 8, 1987, 62-84786

Int. Cl.[4] H01L *23/34, 23/36, 23/46*

U.S. Cl. 357—81 **10 Claims**



1. A cooling apparatus for cooling a semiconductor integrated circuit chip having a cooling flat surface, comprising:

a heat transfer block to be cooled by a coolant, said heat transfer block having a recess confined by at least one inclined surface;

at least one heat conducting member having a contact flat surface corresponding to said cooling flat surface and being kept in contact with said heat transfer block and said semiconductor integrated circuit chip at the same time, the surface of said heat conducting member in contact with said inclined surface of said recess having a curved surface so as to form a line contact; and

a resilient member for urging said at least one heat conducting member with respect to said heat transfer block and said semiconductor integrated circuit chip;

said at least one heat conducting member having at least one inclined surface which is inclined with respect to said cooling flat surface of said semiconductor integrated circuit chip, said at least one heat conducting member being capable of sliding and/or rotating while being kept in contact with said heat transfer block so that, even if said semiconductor integrated circuit chip is displaced in any direction or inclined at any angle with respect to said heat transfer block, the whole of said cooling flat surface of said semiconductor integrated circuit chip can be maintained in contact with said contact surface of said at least one heat conducting member.

4,908,696

CONNECTOR AND SEMICONDUCTOR DEVICE PACKAGES EMPLOYING THE SAME

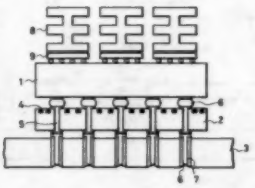
Shousaku Ishihara, Chigasaki; Hitoshi Yokono, Fujisawa; Tsuyoshi Fujita, Yokohama; Ryobei Satoh, Yokohama, and Kiyotaka Wasai, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,124

Claims priority, application Japan, Sep. 19, 1986, 61-219312

Int. Cl.[4] H01L *39/02, 23/02*

U.S. Cl. 357—81 **18 Claims**



1. A semiconductor device package comprising:

a printed board;

a connector having a first side closest to the printed board, the first side having a first surface, the connector being provided on said first surface with pins which are adapted to be inserted into said printed board;

a wiring substrate soldered to a second side of said connector, the connector having conductive material elements extending therethrough from the first side to the second side, the connector having heater means provided around the conductive material elements extending through the connector;

a semiconductor integrated circuit element mounted on said wiring substrate; and

a cooling fin for cooling said semiconductor integrated circuit element, said cooling fin being in thermal connection with said semiconductor integrated circuit element.

4,908,697

TWO-LINE MAC HIGH DEFINITION TELEVISION SYSTEM

Mikhail Tsinberg, Riverdale; Carlo Basile, New York City, and Alan P. Cavallerano, Ossining, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Jul. 24, 1987, Ser. No. 77,557

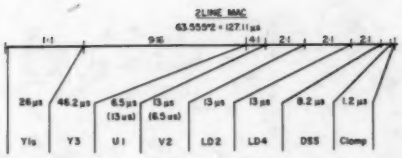
Int. Cl.[4] H04N *11/02, 7/12*

U.S. Cl. 358—12 **23 Claims**

1. Method of encoding a high definition television signal having a predetermined number of frames per second, each frame having a plurality of HDTV lines each having a first line period, each HDTV line comprising a luminance component having a predetermined luminance bandwidth and at least one chrominance component, for transmission or recording with a channel bandwidth less than said luminance bandwidth, comprising the steps of:

processing said plurality of HDTV lines in groups, each group containing information from a multiplicity of sequential HDTV lines, to generate a plurality of signal packets, said signal packets comprising a first luminance component from a first HDTV line having a first time compression ratio, a second luminance component from a second HDTV line having a second time compression ratio, the second time compression ratio being different

from said first time compression ratio, a plurality of line difference components and at least one chrominance component separate from said luminance components; and



generating a time multiplexed line signal having a second line period greater than said first line period by time multiplexing said signal packets in time slots thereof.

4,908,698

COLOR PICTURE IMAGE PROCESSING SYSTEM FOR SEPARATING COLOR PICTURE IMAGE INTO PIXELS

Hajime Enomoto, Funabashi, and Isao Miyamura, Niigata, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 26, 1988, Ser. No. 199,357

Claims priority, application Japan, May 29, 1987, 62-133690; Feb. 22, 1988, 63-39284

Int. Cl.[4] H04N *11/04*

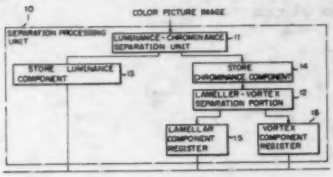
U.S. Cl. 358—13 **4 Claims**

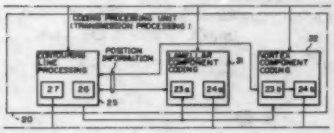
1. A color picture image processing system for separating a color picture image into pixel data, transmitting vector signals constituting chrominance components of the pixel data in a corresponding relationship with a transmission of scalar signals corresponding to luminance components of the pixel data, and reproducing the color picture image from said transmitted vector signals and scalar signals,

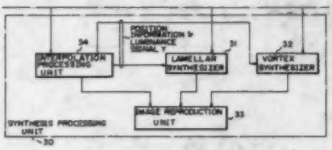
said system comprising:

separation processing means for separating the color picture image into luminance components and chrominance components in correspondence with the pixel data, for separating the separated chrominance components into vector potential components based on a rotation operation on the chrominance components and scalar potential components based on a divergence operation on the chrominance components, and for providing each of said separated components as outputs,

coding processing means operating in response to the outputs of said separation processing means for coding the luminance components and the chrominance components based on a coding of all of the scalar potential components, and







synthesis processing means operating in response to the coded luminance components and the coded chrominance components for synthesizing the color picture image.

4,908,699

COMPONENT VIDEO ACCUMULATION EFFECT

Daniel J. Chaplin, Nevada City; Paul M. Trethewey, Penn Valley; Christopher R. Hansen, Grass Valley, and R. Barry Angell, Nevada City, all of Calif., assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Jan. 23, 1989, Ser. No. 299,290

Int. Cl.[4] H04N *9/74*

U.S. Cl. 358—22 **7 Claims**

1. A method for accumulating component video signals, each having a luminance component and a chrominance component, comprising the steps of:

non-additively mixing the luminance components of the component video signals to produce an accumulated luminance component; and

additively mixing the chrominance components of the component video signals to produce an accumulated chrominance component.

4,908,700

DISPLAY CONTROL APPARATUS FOR DISPLACING AND DISPLACING COLOR IMAGE DATA

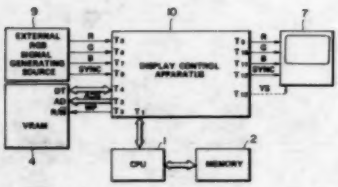
Takatoshi Ishii, and Kazuya Kishioka, both of Tokyo, Japan, assignors to Ascii Corporation, Tokyo, Japan

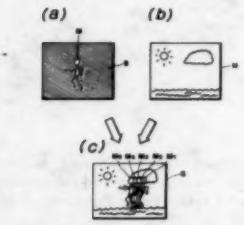
Filed Sep. 24, 1987, Ser. No. 100,590

Claims priority, application Japan, Sep. 29, 1986, 61-230953

Int. Cl.[4] H04N *9/75*

U.S. Cl. 358—22 **1 Claim**





1. A display control apparatus in which color image data to be displayed are converted into predetermined analog image signals by converter means and said analog image signals are supplied to external display means wherein a color image corresponding to said analog image signals is displayed on a screen thereof, said display control apparatus comprising:

(a) register means for storing color range selecting data therein:

(b) means for selecting one of first color image data corresponding to signals which are supplied from an external device and second color image data read from a video memory;

(c) comparator means for comparing the value of color image data selected by said means with the value of said color range selecting data stored in said register means;

(d) selecting means for selecting one of said first color image data and said second color image data based on a comparing result of said comparator means, said selecting means supplying the selected color image data to said converter means, and

(e) rewriting means for displacing said second color image data by said first color image data.

4,908,701

COLOR IMAGE PROCESSING METHOD AND APPARATUS FOR COLOR ADJUSTMENT DURING IMAGE PROCESSING

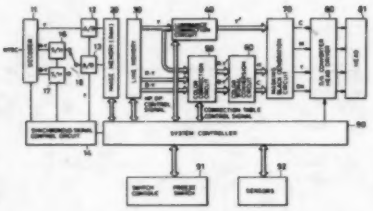
Yoshiro Udagawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,413

Claims priority, application Japan, Mar. 9, 1987, 62-54465; Mar. 27, 1987, 62-71397

Int. Cl.[4] G03F *3/00*

U.S. Cl. 358—80 **28 Claims**



1. A color image processing method comprising the steps of:

detecting a dark point in a color image;

detecting a color component of the detected dark point;

supplying a luminance signal other than that of the dark point; and

correcting a color component other than that of the dark point in accordance with the luminance signal and the detected color component.

4,908,702

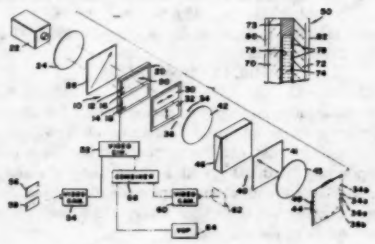
REAL-TIME IMAGE DIFFERENCE DETECTION USING A POLARIZATION ROTATION SPACIAL LIGHT MODULATOR

Tien-Hsin Chao, Valencia, and Hua-Kuang Liu, South Pasadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 29, 1988, Ser. No. 187,716

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—93 **10 Claims**



1. Apparatus for detecting the difference between two images, comprising:

an image display device which includes two created image representations to be compared lying coplanar but spaced from each other, each representation defining an image to be compared;

means for passing light through said two representations;

a first polarizing filter which has a polarization oriented in a first direction, said first filter positioned to pass light which passes through said first representation, to produce a first processed image-representing light beam;

a second filter which has a polarization oriented in a second direction transverse to said first direction, said second filter positioned to pass light which passes through said second representation, to produce a second processed image-representing light beam;

means responsive to the polarizations of said first and second image-processed light, for indicating differences in the images defined by said transparencies;

said image display device comprising at least one display that includes first and second portions, each portion including a multiplicity of rows and columns of individually addressable display pixels whose polarization rotation angle is controllable, video signal generator means for generating signals representing two video images, and means for controlling the pixels in each of said portions according to the output of said generator to represent one of said video images.

4,908,703

METHOD OF MEASURING MEAT TEXTURE

Svend A. Jensen, Soborg, and Peter Haagensen, Valby, both of Denmark, assignors to Lumetech A/S, Hellerup, Denmark

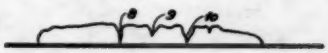
PCT No. PCT/DK87/00139, § 371 Date Jul. 6, 1988, § 102(e) Date Jul. 6, 1988, PCT Pub. No. WO88/03645, PCT Pub. Date May 19, 1988

PCT Filed Nov. 6, 1987, Ser. No. 216,620

Claims priority, application Denmark, Nov. 6, 1986, 5305/86

Int. Cl.[4] G01N *21/88, 33/12*

U.S. Cl. 358—106 4 Claims



1. A method of detecting meat texture, characterized by illuminating the surface of the meat by means of angularly adjustable uniform sources of light in at least two directions which, in a common illumination plane substantially perpendicular to a base for the meat, form acute angles with the base, and producing image information of the illuminated surface by means of a single camera seen from an area in the vicinity of the illumination plane and the angle bisector plane for said illumination directions.

4,908,704

METHOD AND APPARATUS FOR OBTAINING AN OBJECT IMAGE AND DISTANCE DATA OF A MOVING OBJECT

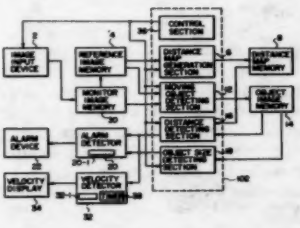
Arisa Fujioka, Kawaguchi, and Sadakazu Watanabe, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 9, 1988, Ser. No. 282,257

Claims priority, application Japan, Dec. 11, 1987, 62-312192

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—108 17 Claims



1. An apparatus for monitoring a moving object, comprising:

image memory means for storing reference monitor images of a designated monitor region;

distance map generation means for performing predetermined transformation processing of the reference monitor image to generate a distance map from the reference monitor image, the distance map comprising a plurality of blocks, each block including at least one pixel, and the distance map having distance data from a predetermined reference point to points in the designated monitor region corresponding to each of the blocks;

distance map memory means for storing the distance map;

object image detecting means for detecting an object image of the moving object from an input monitor image of the designated monitor region and the reference monitor image stored in said image memory means; and

distance detecting means for detecting a distance from the reference point to the moving object from the detected object image and the distance map stored in said distance map memory means.

4,908,705

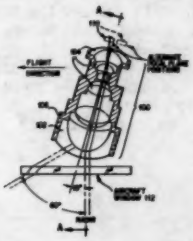
STEERABLE WIDE-ANGLE IMAGING SYSTEM

Ralph Wight, Northport, N.Y., assignor to Fairchild Weston Systems, Inc., Syosset, N.Y.

Filed Jan. 21, 1988, Ser. No. 146,696

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—109 96 Claims



1. A reconnaissance system, for mounting in an aircraft, comprising:

a wide-angle lens positioned to image ground-level surface onto a fixed focal plane; and

an electro-optic imager having a substantially one-dimensional imaging area, and movable within the focal plane defined by said lens and having its long dimension oriented substantially normal to the vector within the image of the ground-level surface which corresponds to the flight track of the aircraft; and

one or more mechanical linkages which move said imager within said focal plane to point to a desired strip which is either forward or aft of the nadir of the aircraft.

4,908,706

TELETEXT DECODER ARRANGEMENTS

Richard E. F. Bugg, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1989, Ser. No. 310,801

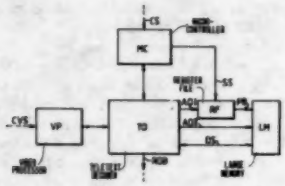
Claims priority, application United Kingdom, Feb. 26, 1988, 8804608

Int. Cl.[4] H04N *7/08*

U.S. Cl. 358—147 13 Claims

1. A teletext decoder arrangement comprising a plurality of data acquisition circuits, a memory having a capacity for storing a large number of acquired pages in separate memory chapters, first addressing means for addressing the chapters individually and second addressing means for addressing byte locations in each chapter, which teletext decoder arrangement

is characterised in that said first addressing means includes a register file having a number of word locations in each of which any one of a plurality of different pointer bytes can be stored, said word locations being addressable, to read out a pointer byte stored therein, by respective word addresses each of which pertains to a respective one of the data acquisition circuits, each of said pointer bytes identifying according to its



bit values a respective memory chapter and each being usable when read out from a word location to select its memory chapter for the storage therein of a page acquired by the appertaining data acquisition circuit, the arrangement further including processor means for identifying the word location concerned by its word address and for determining the bit values of the pointer byte in that word location.

4,908,707

VIDEO CASSETTE RECORDER PROGRAMMING VIA TELETEXT TRANSMISSIONS

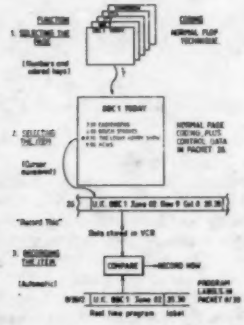
John R. Kinghorn, Ashtead, Great Britain, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,156

Claims priority, application United Kingdom, Jul. 20, 1987, 8717132; Aug. 5, 1987, 8718557

Int. Cl.[4] H04N *7/087*

U.S. Cl. 358—147 **6 Claims**



1. A television transmission system comprising:

(a) a transmitter station including teletext data transmitting means for transmitting teletext pages containing:

(i) teletext display data representing displayable programme details; and

(ii) teletext non-display data representing programming information associated with the programme details, which non-display data is:

(A) usable for video recorder programming;

(B) in addition to and not replacing possible teletext display data; and

(C) contained in at least one extension packet which is in addition to data packets of a teletext page contains teletext display data;

(b) at least one television receiver; and

(c) at least one respective video recorder, interconnected with a respective one of the at least one television receiver.

4,908,708

LIGHT BEAM SCANNING OPTICAL SYSTEM

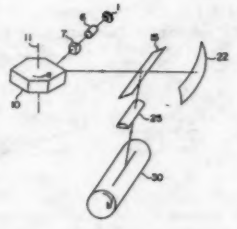
Muneo Kuroda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1989, Ser. No. 342,344

Claims priority, application Japan, May 27, 1988, 63-130846; May 27, 1988, 63-130847

Int. Cl.[4] H04N *1/29, 3/08*

U.S. Cl. 358—206 **12 Claims**



1. A light beam scanning optical system, comprising:

a light source;

a luminous flux converging means for converging luminous flux emitted from the light source into a straight line in a direction parallel to a beam scanning plane;

a deflection device disposed in the vicinity where a luminous flux is converged in a straight line for deflecting the converged luminous flux at an equiangular velocity;

a mirror having a concave surface curved in a circular arc in the direction of deflection for turning and collecting luminous flux deflected by the deflection device onto the surface of a photoconductor; and

a cylindrical lens disposed between the mirror and a light collecting point, wherein the relationship among the deflection device, mirror and cylindrical lens fulfills the following three equations.

$$|s/R| > 0.5$$

$$0.15 < d/|R| < 0.45$$

$$(|d_2| + |d_3|)/|R| < 0.45,$$

wherein R is a radius of curvature of the mirror in the direction of deflection, s is a distance from a point of reflection of luminous flux directed toward the center of the scanning area by the deflection device to a light collecting point after reflection of the deflection device, d is a distance from a point of reflection of luminous flux directed toward the center of the scanning area by the deflection device to the mirror, d_2 is the thickness of the cylindrical lens, and d_3 is a distance from the plane of projection of the cylindrical lens to the light collecting surface.

4,908,709

SOLID-STATE ELECTRONIC IMAGING DEVICE WITH A PHOTOMETRY FUNCTION RESPONSIVE TO DISCARDED CHARGE PACKETS

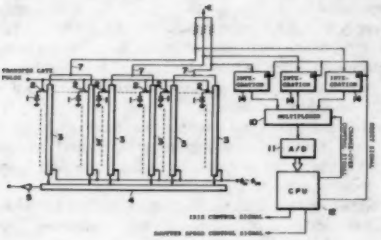
Masafumi Inuiya; Yukio Hagino, and Jun Inada, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 9, 1988, Ser. No. 281,779

Claims priority, application Japan, Dec. 11, 1987, 62-312151; Jun. 13, 1988, 63-3881

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.19 6 Claims



1. A solid-state electronic imaging device comprising:

a plurality of photoelectric converter elements disposed in vertical and horizontal directions for accumulating therein signal electric charge corresponding to an amount of incident light;

vertical transfer sections arranged in a vertical direction adjacent to said photoelectric converter elements arranged in the vertical direction, said vertical transfer sections transferring signal electric charge in a direction toward output terminals in response to a transfer signal and reversely transferring signal electric charge in a direction toward discharge exit terminals disposed at a position opposite to the output terminals in response to a reverse transfer signal;

transfer gates for transferring the signal electric charge accumulated in said photoelectric converter elements to said vertical transfer sections adjacent thereto in response to a gate signal;

a measuring circuit connected to the discharge exit terminals of said vertical transfer sections for measuring an amount of the incident light corresponding to an amount of the signal electric charge reversely transferred; and

a horizontal transfer section connected to the output terminals of said vertical transfer sections for sequentially transferring in a horizontal direction the signal electric charge forwardly transferred, thereby outputting a video signal.

4,908,710

METHOD FOR DRIVING A LIQUID CRYSTAL DISPLAY DEVICE

Yoichi Wakai, and Hiroyuki Baba, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,448

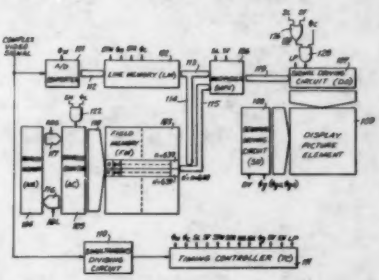
Claims priority, application Japan, May 12, 1987, 62-115417; May 21, 1987, 62-124919; Jul. 21, 1987, 62-181332; Sep. 30, 1987, 62-247461

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—236 26 Claims

1. A video display method for driving a liquid crystal display for an interlaced video signal system having a line memory for storing one horizontal period of video data of a complex video signal, a field memory for storing one field of video data, a signal driving circuit for generating signal driving signals in response to the video data transferred from either the line memory or the field memory and a scanning driving circuit for generating scanning driving signals for a display in which the video signal is divided into an odd and even field comprising the following steps:

sequentially writing the video data of one horizontal period of the video signal in the line memory;



during the first half of the horizontal period of the video signal, transferring the video data of the previous field, which has been stored before and after the present horizontal period to the signal driving circuit; and

during the second half of the horizontal period, transferring the video data stored in the line memory to the signal driving circuit.

4,908,711

ELECTRONIC WRITING BOARD

Osamu Majima; Koichiro Kakinuma; Tohru Naganuma, and Makoto Ando, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,167

Claims priority, application Japan, Jun. 24, 1987, 62-157176; Feb. 26, 1988, 63-43361

Int. Cl.[4] H04N *1/23;* G01D *9/00*

U.S. Cl. 358—296 17 Claims

1. A flexible electrostatic recording medium capable of forming latent electrostatic images by the action of an electrotatic recording head thereon comprising:

a flexible base layer composed of a synthetic resin,

a flexible, electrically conductive layer formed on said base layer, and

a flexible dielectric layer composed of polyvinylidene fluoride formed on said conductive layer.

11. A display apparatus comprising:

a frame,

sheet guides supported by said frame,

a flexible sheet supported for movement by said sheet guides,

a recording head arranged to contact a surface of said flexible sheet,

a developing device for rendering visible a latent image formed on said flexible sheet by said recording head,

said flexible sheet comprising a base layer of synthetic material, an electrically conductive layer formed on said base layer and a dielectric layer composed of polyvinylidene fluoride formed on said conductive layer.

4,908,712

METHOD FOR TONE REPRODUCTION IN IMAGE FORMING SYSTEM

Tadamitsu Uchiyama, and Tetsuya Iida, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1989, Ser. No. 320,556

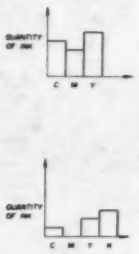
Claims priority, application Japan, Mar. 9, 1988, 63-53838

Int. Cl.[4] G03F *3/08;* H04N *1/21;* G01D *15/16*

U.S. Cl. 358—298 8 Claims

1. A method for forming a multi-tone color image using the inks of the four colors, cyan, magenta, yellow, and black,

which method comprises effecting reproduction of an achromatic color component of a recording spot by solely using said black ink where the tone level of the achromatic color component is lower than a prescribed value and by using the inks of the three colors of cyan, magenta, and yellow together with the black ink where said tone level is higher than said prescribed value.



4,908,713

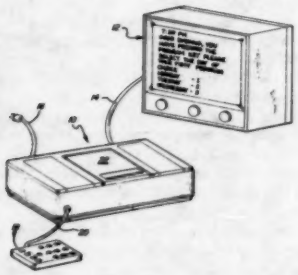
VCR PROGRAMMER

Michael R. Levine, 2900 Heatherway, Ann Arbor, Mich. 48104

Continuation of Ser. No. 634,179, Jul. 24, 1989, abandoned, which is a continuation of Ser. No. 330,111, Dec. 14, 1981, abandoned. This application Jun. 29, 1988, Ser. No. 213,162

Int. Cl.[4] H04N *5/782;* **H04B** *11/16*

U.S. Cl. 358—335 **30 Claims**



1. A video recorder interactive control system for connection to a source of television signals and a television display, the system comprising:

an electronically adjustable television channel tuner connected to the source of television signals;

a video record/playback means having a input connected to said television channel tuner and a video output, said video record/playback means operating in a record mode for recording the television signal tuned by said television channel tuner and in a playback mode for reproducing a previously recorded television signal;

a character generator having an input for receiving digital signals representative of a video display, said character generator being operative to convert said digital signals into a video signal;

an interface means connected to the television display, said video record/playback means and said character generator for displaying either said video signal from said video record/playback means or said video signal from said character generator via the television display;

a clock means for generating a real time clock signal indicative of the current time;

a record program memory having stored therein the channel and the time of occurrence of at least one instance of a future program which it is desired to record;

a schedule memory having stored therein a plurality of digital signals representive of a schedule of television programming available for a future period;

an operator controlled input means for entering a plurality of control inputs for said video recorder interactive control system; and

a control means connected to said television channel tuner, said video record/playback means, said character generator, said interface means, said clock means, said message memory, said record program memory, said schedule memory and said input means, said control means being operative to

supply a channel input to said television channel tuner in accordance with control inputs from said input means,

place said video record/playback means in either record mode or playback mode in response to control inputs from said input means,

store the channel and the time of at least one instance of a desired future recording program in said record program memory in response to control inputs from said input means,

compare said real time clock signal with the time for the next instance of a desired future recording program stored in said record program memory,

supply said channel stored in said record program memory for an instance of a desired future recording program to said television channel tuner,

recall digital signals representative of an appropriate portion of the schedule of programming available for a future period from said schedule memory,

supply said digital signals to said character generator, and

select said video signal from said character generator at said interface means for display via the television display.

4,908,714

IMAGE TRANSMISSION APPARATUS

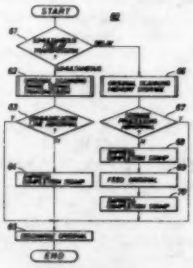
Norio Iriyama, Tokyo; Kunio Shijo, and Yutaka Aoki, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 236,980

Claims priority, application Japan, Aug. 29, 1987, 62-216032

Int. Cl.[4] H04N *1/00*

U.S. Cl. 358—405 **4 Claims**



1. An image transmission apparatus comprising:

original reading means;

memory means for storing an image signal read by said original reading means;

communicating means;

impressing means for impressing a predetermined stamp on an original; and

control means for controlling said impressing means so that different stamps are impressed when the read image signal is directly transmitted by said communicating means and when the read image signal is stored in said memory means.

4,908,715

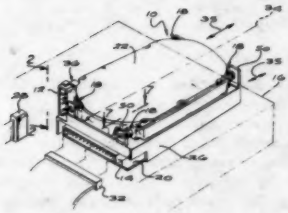
DISK DRIVE UNIT

Richard G. Krum, Thousand Oaks, and Neil E. Bucknam, Simi Valley, both of Calif., assignors to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Mar. 29, 1988, Ser. No. 174,702

Int. Cl.[4] G11B *5/02*

U.S. Cl. 360—97.02 12 Claims



1. A disk drive unit, comprising:

a disk drive housing;

a circuit board carrying drive electronics;

a relatively rigid chassis for supporting said disk drive housing and said circuit board, said chassis having front and rear ends;

an interface connector mounted generally at said rear end of said chassis;

a power connector plug; and

a mounting bracket secured into said chassis and including means for securely mounting said power connector plug onto said chassis generally at said chassis rear end, said interface connector and said power connector plug being oriented on said chassis so that the disk drive unit can be slidably displaced in a rearward direction for slide fit coupling of said interface connector and said power connector plug with mating fittings of a computer system;

said power connector plug including at least one outwardly projecting tab, and wherein said mounting bracket is shaped for seated reception of said power connector plug and has a slot formed therein for receiving said tab when said plug is seated within said mounting bracket.

7. A disk drive unit, comprising:

a disk drive housing;

a circuit board carrying drive electronics;

a relatively rigid chassis for supporting said disk drive housing and said circuit board, said chassis having front and rear ends;

an interface connector mounted generally at said rear end of said chassis;

a power connector plug;

means for securely mounting said power connector plug onto said chassis generally at said chassis rear end, said interface connector and said power plug being oriented on said chassis so that the disk drive unit can be slidably displaced in a rearward direction for slide fit coupling of said interface connector and said power connector plug with mating fittings of a computer system; and

further including means for mounting said circuit board to said disk drive housing, said circuit board mounting means including a plurality of mounting screws passed through ports formed in said circuit board and fastened into bosses on said disk drive housing, at least some of said circuit board ports being oversized to permit at least some freedom of movement permitting the circuit board to float in its own plane relative to said housing to accommodate thermal size shift during normal disk drive unit operation.

4,908,716

IMAGE PROCESSING APPARATUS

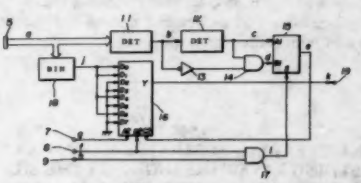
Yukio Sakano, Fuchu, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 7, 1988, Ser. No. 280,952

Claims priority, application Japan, Dec. 8, 1987, 62-308684; Feb. 29, 1988, 63-47098

Int. Cl.[4] H04M *1/40*

U.S. Cl. 358—453 10 Claims



1. An image processing apparatus having editing modes in which an arbitrary image portion in an arbitrary area of a document image is extracted and outputted as a processed image, said editing modes including at least a trimming mode and a masking mode, said image processing apparatus comprising:

input terminal means for receiving an image signal describing a document image, said document image including a marking which designates a desired image portion to be trimmed or masked by at least encircling an area of the document image;

first means coupled to said input terminal means for generating a first signal indicating a marked area which is encircled by said marking and excludes said marking;

second means coupled to said input terminal means for generating a second signal indicating a marked area which is encircled by said marking and includes said marking; and

selector means coupled to said input terminal means for selectively outputting one of a binary image signal derived from the image signal and a predetermined reference signal responsive to said first and second signals in the editing mode, thereby outputting a binary processed image signal describing a processed image in which said desired image portion is trimmed or masked at the marked area.

4,908,717

IMAGE SCANNER USING A ROD-TYPE LIGHT SOURCE

Katsushi Natori, Kofu, Japan, assignor to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed Dec. 30, 1988, Ser. No. 292,433

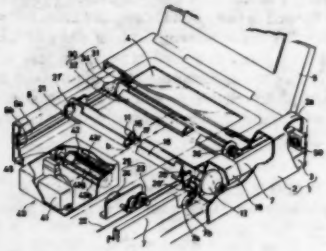
Claims priority, application Japan, Jun. 4, 1988, 63-137879; Jun. 8, 1988, 63-76103[U]; Jun. 8, 1988, 63-76104[U]

Int. Cl.[4] H04M *1/04*

U.S. Cl. 358—474 14 Claims

1. An image scanner for optically reading a given objective

image and outputting image data signals, which comprises a casing, a light source unit including a transparent light-emitting rod and a light source lamp attached to one end of said light-emitting rod so as to emit light inside said light-emitting rod to thereby radiate outside a beam of light from said light-



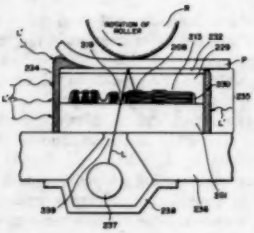
emitting rod, at least one guide rail means, a light source driving means for allowing said light source unit to move parallel along the guide rail means, and a shielding means for partitioning inside said casing into an image reading region in which said light-emitting rod moves and a lamp moving region in which said light source lamp moves.

4,908,718

IMAGE READING APPARATUS HAVING A LIGHT SHIELDING LAYER ARRANGED ON THE SIDES OF THE SUBSTRATE AND PROTECTIVE LAYERS OF A PHOTO SENSOR

Tetsuya Shimada, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,848
Claims priority, application Japan, Jul. 9, 1987, 62-172008
Int. Cl.[4] H04N *1/024*
U.S. Cl. 358—494 **37 Claims**



1. A photo sensor for an image reading apparatus, comprising:

a light-transmissive substrate;

a light shielding layer arranged on a portion of a surface of said substrate;

an insulative layer arranged on said light shielding layer;

a photoconductive semiconductor layer arranged on said insulative layer;

protective layers arranged on said photoconductive semiconductor layer, wherein light irradiated through a back side of the substrate is reflected from an original and received by said photoconductive semiconductor layer, thereby reading image information; and

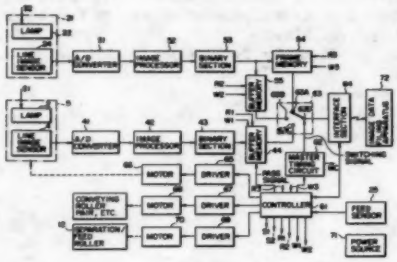
light shielding means provided on the sides of the substrate and on the sides of the protective layers.

4,908,719

SCANNING APPARATUS WITH A MECHANISM TO SCAN BOTH SIDES OF AN ORIGINAL

Makoto Nonoyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 8, 1988, Ser. No. 281,564
Claims priority, application Japan, Dec. 26, 1987, 62-330510; Dec. 26, 1987, 62-330511
Int. Cl.[4] H04N *1/04, 1/10, 1/12*
U.S. Cl. 358—494 **16 Claims**



1. A scanning apparatus with a scanning mechanism for scanning an original, comprising:

means for conveying an original having first and second sides on which image data is recorded;

first scanning means for scanning the image data on the first side of said original moving on said conveyance means;

second scanning means, provided on an opposite side to said first scanning means with said conveyance means in between at a proximity of said first scanning means, for scanning the image data on the second side of said original moving on said conveyance means;

means for storing said image data scanned by said first scanning means; and

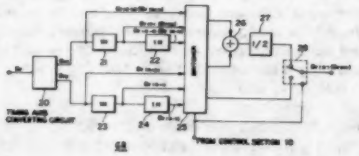
means for sequentially outputting contents of said storage means and said image data scanned by said second scanning means.

4,908,720

SOLID-STATE COLOR IMAGE PICKUP CAMERA WHICH HAS REGISTRATION ADJUSTING CIRCUITS SO AS TO ADJUST THE RED AND BLUE IMAGES SO THAT THEY REGISTER WITH THE GREEN IMAGE

Fumio Nagumo, c/o Sony Corporation, 7-35, Kitashinagawa 6-chome, Shinagawa-ku, Japan

Continuation-in-part of Ser. No. 155,585, Jan. 12, 1988, abandoned. This application May 4, 1989, Ser. No. 347,719
Claims priority, application Japan, Feb. 20, 1987, 62-37242
Int. Cl.[4] H04N *9/093, 9/09*
U.S. Cl. 358—51 **4 Claims**



1. A solid-state color image pickup apparatus which has a plurality of solid-state image pickup elements, the apparatus comprising:

a color decomposing prism which receives an incident light image and decomposes it into red, blue, and green light images;

a plurality of solid-state image pickup elements which are responsive to the red, blue, and green light images and which produce analog signals representing the three primary colors red, blue, and green, wherein at least the red and blue analog signals have more horizontal scanning lines than are normally used in one conventional television field;

a plurality of analog-to-digital (A/D) converters which receive and digitize the red, blue, and green analog signals;

a pair of registration adjustment means which receive and interpolate the red and blue digital signals;

a control means which controls said pair of registration adjustment means on the basis of control data; and

a control data storage which supplies the control data to said control means.

4,908,721

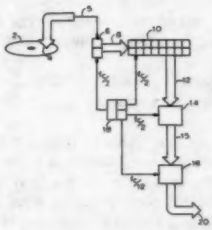
IMPROVED DECODER

Bernardo Ruh, Shrewsbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 12, 1988, Ser. No. 193,347

Int. Cl.[4] G11B *5/09*; H03M *7/04*

U.S. Cl. 360—40 **8 Claims**



1. A decoder for decoding data which is in the form of code words, said decoder comprising:

A. a p-bit shift register for receiving encoded bits;

B. means for shifting the encoded bits from said p-bit shift register each time said shift register receives p bits;

C. a second shift register consisting of a predetermined number of p-bit stages connected to receive a predetermined number of the bits shifted from said p-bit shift register by said shifting means, said second shift register including at least q stages, with the stages together being capable of storing a number of bits corresponding to one or more code words;

D. decoding means for receiving signals corresponding to the bits stored in said second shift register and providing in response thereto corresponding decoded data; and

E. means for supplying said signals to said decoding means each time said second shift register receives a predetermined number of bits from said p-bit shift register.

4,908,722

DIGITAL MAGNETIC RECORDING/REPRODUCTION APPARATUS AND METHOD

Yoshiaki Sonobe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 1, 1988, Ser. No. 214,584

Claims priority, application Japan, Jul. 3, 1987, 62-166688

Int. Cl.[4] G11B *5/09, 15/14*

U.S. Cl. 360—46 **14 Claims**

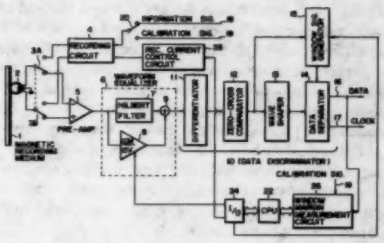
1. A digital magnetic recording/reproduction apparatus for recording and reproducing a digital information signal, comprising:

means for recording the digital information signal and a calibration signal with a specific digital pattern in a magnetic recording medium, through the same signal path;

means for reproducing the recorded digital information signal and the recorded calibration signal through the same signal path, and for outputting a reproduced signal;

means for equalizing a waveform of said reproduced signal;

data discriminating means for discriminating a data signal from the output signal of said waveform equalizing means, by using a window signal; and



means for controlling the characteristic of said waveform equalizing means so as to maximize a window margin of said data discriminating means, on the basis of at least one of said reproduced signal and said data signal corresponding to said calibration signal;

wherein said waveform equalizing means includes a filter means for Hilbert transforming said reproduced signal, a multiplying means for multiplying said reproduced signal by a coefficient provided from said controlling means, and a means for combining the output signal of said multiplying means and the output signal of said filter means.

4,908,723

COMPACT RECORDING AND/OR REPRODUCING APPARATUS WITH OBLIQUE ROTARY HEAD

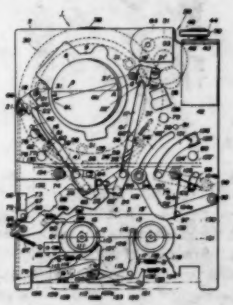
Masao Ohyama, and Tsuyoshi Nagasawa, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,640

Claims priority, application Japan, Feb. 14, 1985, 60-27374

Int. Cl.[4] G11B *15/61*

U.S. Cl. 360—85 **41 Claims**



1. A recording and/or reproducing apparatus for a magnetic tape in a magnetic tape cassette, comprising:

first means for receiving said magnetic tape cassette to drivingly cooperate therewith;

a rotary head means having an axis and a top surface and adapted to record and/or reproduce signals on said magnetic tape;

second means for extracting a predetermined length of magnetic tape from said magnetic tape cassette and moving

said predetermined length of magnetic tape to various positions corresponding to various operation modes of said recording and/or reproducing apparatus, said second means including first and second movable members respectively movable along predetermined first and second paths to various positions for positioning said magnetic tape at one of said various positions corresponding to a selected one of said various operation modes;

third means for mounting said rotary head means on said recording and/or reproducing apparatus such that the axis of said rotary head means lies oblique to a vertical axis in such a manner that first ends of said first and second paths, which first ends of said first and second paths lie adjacent said rotary head means and at which said first and second movable members place said magnetic tape at a loading mode position for recording and reproduction, are arranged on a plane extending through the uppermost t and the lowermost point of the top surface of said rotary head means, and proximal to said first means, whereby the difference between the lengths of maximum stroke of said first and second movable members along said first and second paths can be minimized; and

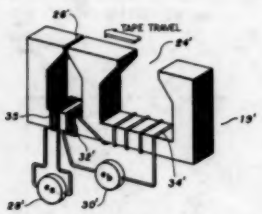
fourth means for driving said recording and/or reproducing apparatus through various modes of operation, said fourth means actuating said second means so as to shift said first and second members along said first and second paths to an extent in accordance with said mode of operation of said recording and/or reproducing apparatus.

4,908,724

DUAL GAP CROSS-FIELD MAGNETIC RECORDING HEAD WITH SINGLE GAP SIGNAL EXCITATION

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,760
Int. Cl.[4] G11B *5/17, 5/265*
U.S. Cl. 360—123 **3 Claims**



1. An improved cross-field head adapted for recording on a moving magnetic tape, said head having a magnetic structure of uniform core thickness in the trackwise direction transverse to the direction of motion of said tape, said core including a wide gap and a narrow gap for contacting said magnetic tape, said structure having first and second coils adapted for magnetically exciting said wide gap and said narrow gap respectively by means of a biasing source, whereby bias fields are provided at said wide gap and said narrow gap, said bias fields determining a record zone in the region of said narrow gap, the improvement comprising:

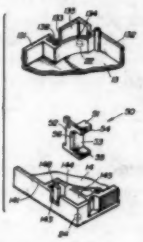
(a) means for magnetically exciting said narrow gap by a signal source, whereby said means for magnetically exciting said narrow gap in combination with said first coil and said second coil effects recording of said signal in said tape.

4,908,725

RECORDING MEDIUM CASING WITH ERASE PREVENTION DEVICE

Yuuji Iwahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 907,810, Sep. 16, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 243,202
Claims priority, application Japan, Oct. 14, 1985, 60-157252
Int. Cl.[4] G11B *15/04*
U.S. Cl. 360—132 **6 Claims**



1. An erase prevention device for use in a recording medium casing to selectively inhibit recording on a recording medium contained in said recording medium casing placed in a recorder, wherein said recording medium casing has a first color, comprising:

coaxial holes formed in said recording medium casing to provide an inspection passage;

a slider;

means for guiding said slider in sliding movement in said recording medium casing between a first position and a second position, said slider having first and second portions and a second color different from said first color, said first portion of said slider opening said coaxial holes to open said inspection passage so as to inhibit operation of said recorder in a recording mode when said slider is in the first position, said first portion of said slider closing said coaxial holes to interrupt said inspection passage so as to allow operation of said recorder in a recording mode when said slider is in the second position; and

an aperture formed in said recording medium casing for providing a visible indication that said recording medium can be used for recording operation, said second portion of said slider opening said aperture in the first position of said slider, said second portion of said slider closing said aperture in the second position of said slider,

whereby said second color of said slider is substantially out of the view of a user through both said coaxial holes and said aperture when said slider is in the first position, and said second color is visible to a user through both said coaxial holes and said aperture when said slider is in the second position.

4,908,726

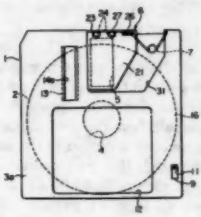
DISK CARTRIDE HAVING AN IMPROVED SHUTTER

Yoshitake Kato, Ibaraki, Japan, assignor to Hitachi Maxell, Ltd., Ibaraki, Japan

Division of Ser. No. 19,542, Feb. 26, 1987, Pat. No. 4,849,844. This application May 25, 1989, Ser. No. 356,877
Claims priority, application Japan, Mar. 1, 1986, 61-44891
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **5 Claims**

1. A disk cartridge which includes a U-shaped shutter with

upper and lower side plates slidably arranged on a cartridge case and made from a plastic comprising 0.1 to 10% by weight



of a lubricant by molding such that the thickness of the upper and lower side plates is no more than 1.0 mm.

4,908,727

DISK WITH SUBSTRATE OF ALUMINA SILICATE RESIN GLASS

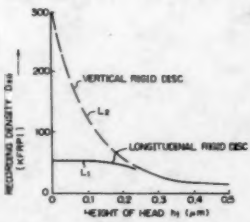
Joichiro Ezaki, and Kazumasa Fukuda, both of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 872,240, Jun. 9, 1986, Pat. No. 4,803,577. This application Nov. 8, 1988, Ser. No. 268,889

Claims priority, application Japan, Jun. 12, 1985, 60-128874; Jun. 12, 1985, 60-128875

Int. Cl.[4] G11B *5/82*

U.S. Cl. 360—135 **4 Claims**



1. A recording disk having a magnetization axis in the vertical direction comprising a rigid substrate made of alumina silicate resin glass ceramic, and a vertical magnetic anisotropic film coupled with said substrate, wherein the improvement comprises that maximum surface roughness R_{max} of said substrate is less than 50 Å.

4,908,728

VCR PROTECTOR FOR VCR MACHINE

Stephen M. Pinkett, 2429 Keyworth Ave., Baltimore, Md. 21215

Filed Aug. 5, 1988, Ser. No. 228,500

Int. Cl.[4] G11B *33/00*; E05B *65/00*; B65D *55/14*

U.S. Cl. 360—137 **3 Claims**

1. A VCR protector is provided to prevent foreign objects from being inserted into a VCR tape entrance port of a VCR machine when the VCR machine is not in use, comprising, a housing, a VCR protector in said housing having a pair of elongated shaped openings provided therein with spaced levers extending outwardly therethrough said openings, coiled spring means for spring biasing each of said outwardly extending levers to lock said VCR protector in said entrance part, means for fastening each of said biased levers to said housing, and a shield means positioned in the front of said housing to prevent the insertion of foreign objects into the tape entrance port by completely blocking the entrance port.

4,908,729

LIGHTNING ARRESTER MONITOR

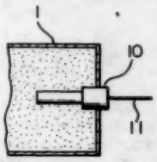
Takeo Yoshioka; Masahiro Kobayashi; Tadao Minagawa, and Katsu Ujita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,397

Claims priority, application Japan, May 27, 1988, 63-128282

Int. Cl.[4] H02H *9/04*

U.S. Cl. 361—118 **8 Claims**



1. A lightning arrester monitoring device, comprising an oxygen gas sensor provided in a lightning arrester of the type having a zinc-oxide-type element made of zinc oxide as a main component and other oxides, said gas sensor measures the oxygen concentration in the lightning arrester which increases as degradation of said element goes on.

4,908,730

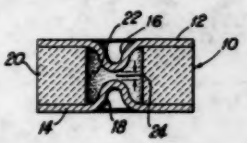
SURGE ARRESTER WITH SHUNT GAP

Arthur C. Westrom, Stone Mountain, Ga., assignor to Kearney, Atlanta, Ga.

Continuation-in-part of Ser. No. 257,974, Oct. 14, 1988, abandoned. This application Jan. 18, 1989, Ser. No. 298,463

Int. Cl.[4] H02H *3/22*

U.S. Cl. 361—120 **38 Claims**



1. An electric surge arrester comprising:

a varistor having top and bottom sides and a hole therethrough, the hole passing through both the top and bottom sides;

a pair of opposed, spaced apart electrodes attached to the top and bottom sides of the varistor at least one of the electrodes having a dimple projecting inwardly into said hole in said varister providing a shunt gap between the pair of opposed electrodes within said varistor; and

a conductive joint attaching each of the electrodes to their associated side of the varistor, the joints sealing the hole in the disk and preventing oil or water outside the disk from entering said hole.

4,908,731

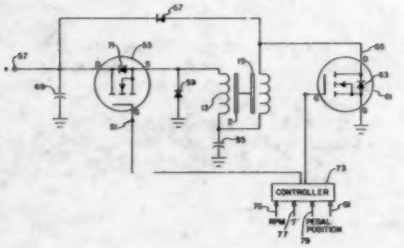
ELECTROMAGNETIC VALVE ACTUATOR

Willian E. Richeson, Jr., Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Division of Ser. No. 21,195, Mar. 3, 1987, Pat. No. 4,794,890. This application Aug. 15, 1988, Ser. No. 233,119

Int. Cl.[4] H01F *7/18*

U.S. Cl. 361—159 **5 Claims**



1. A bistable electromechanical transducer having an armature reciprocable between first and second positions, a latching arrangement for maintaining the armature in one of said positions, an electromagnetic repulsion arrangement operable when energized to dislodge the armature from the position in which the armature was maintained, and control circuitry for temporarily energizing the electromagnetic repulsion arrangement and upon cessation of energization for accumulating the energy from a collapsing magnetic field as a charge.

4,908,732

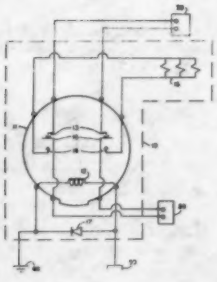
ELECTRONIC SIREN INTERRUPT SYSTEM

Lavelle W. Davis, II, 12750 Beaubien Rd., Jacksonville, Fla. 32223

Filed Sep. 14, 1987, Ser. No. 95,629

Int. Cl.[4] H01N *47/00*

U.S. Cl. 361—170 **7 Claims**



1. A device attached to an electronic communication and siren system, said system having a microphone for voice communication, a siren signal source, an external speaker, a positive voltage source for power, a negative ground controlled by operation of said microphone such that activating the microphone for voice communication completes a circuit to the negative ground, and means to connect auxiliary circuits to said negative ground such that the auxiliary circuits are also controlled by operation of the microphone; the device comprising the following components:

a relay comprising two sets of contacts and a set of mobile contacts, the mobile contacts being connected in circuit to the siren signal source, one set of contacts being connected in circuit to the external speaker, and the other set of contacts being connected in circuit to one or more resistors; where the mobile contacts are controlled by a coil, said coil being connected in an auxiliary circuit between the negative ground and the positive voltage source;

where the coil is activated when a completed circuit is made to the negative ground by operation of the microphone, such that activation of the coil causes the mobile contacts to complete a circuit from the siren signal source through the contacts connected in circuit to the one or more resistors, and further such that non-operation of the microphone deactivates the coil and allows the mobile contacts to complete a circuit from the siren signal source through the contacts connected in circuit to the external speaker;

such that a completed circuit is maintained from the siren signal source to the external speaker, allowing an audible siren sound to be produced, unless the microphone is operated to effect voice communication, such operation causing the siren signal to be routed into the one or more resistors and thereby silencing the siren.

4,908,733

SWITCH BOX FOR WALL ATTACHMENT

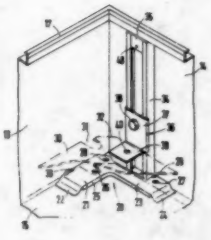
Jurgen Zachrei, Dillenburg-Nanzenbach, and Jurgen Debus, Dietzholztal, both of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 19, 1989, Ser. No. 340,211

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3812941

Int. Cl.[4] H02B *1/08*

U.S. Cl. 361—356 **19 Claims**



1. A switch box for wall attachment having a box-like cabinet body comprising a rear wall and four side walls forming an open side which can be closed by cabinet cover means, said switch box comprising:

a mounting angle (20) attached in each of four corner areas on an internal side of a rear wall (15), said mounting angle (20) having a first leg (21) and a second leg (23), said first leg (21) having a first threaded mounting (26), said second leg (23) having a second threaded mounting (27), and a third threaded mounting (28) positioned in an adjoining area of said first leg (21) and said second leg (23), said first leg (21) and said second leg (23) positioned in a plane parallel to said rear wall (15) and spaced at a distance from said rear wall (15), said first leg (21) and said second leg (23) each having an external edging (25) abutting a corresponding side wall of said side walls (11, 12, 13, 14) which meet forming said corner area (11, 12; 12, 13; 13, 14; 14, 11);

an external leg longitudinal edge of at least one of said first leg (21) and said second leg (23) having a recess (29) for accepting a support strip (34) which is secured in an area of said open side of said cabinet body (10);

and at least one of said first threaded mounting (26), said second threaded mounting (27) and said third threaded

mounting (28) being accessible through a hole in said rear wall (15).

4,908,734

HOUSING FOR MOTOR CONTROL UNIT

Yoshiki Fujioka, Higashiyamato, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

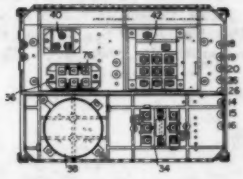
PCT No. PCT/JP87/00848, § 371 Date Jun. 8, 1988, § 102(e) Date Jun. 8, 1988, PCT Pub. No. WO88/03745, PCT Pub. Date May 19, 1988

PCT Filed Nov. 4, 1987, Ser. No. 211,233

Claims priority, application Japan, Nov. 12, 1986, 61-269151

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—383 **14 Claims**



1. A housing for a motor control unit, comprising:

a plastic case having upstanding walls and a bottom, the bottom having an upper surface provided at predetermined locations with ribs and a plurality of mounting holes of the same size extending into the bottom from the upper surface of the bottom, and the walls having an upper portion provided with a predetermined number of engaging members at corners of the case;

a plurality of power components housed in said case and fixed at said mounting holes by screws, each screw being the same size and each power component being provided at an upper portion with energizing terminals of the same size;

a printed circuit board having an underside on which there is formed a circuit pattern which contacts the energizing terminals of said power components and an upper side on which circuit components are disposed, said printed circuit board being fixed to the case by inserting the engaging members of said case through engaging holes formed at corresponding corners of said printed circuit board; and

heat radiating fins selected to have a predetermined heat capacity and fixed to an underside of the bottom portion of the case so as to be freely attachable and detachable.

4,908,735

ELECTRONIC APPARATUS REDUCING GENERATION OF ELECTRO MAGNETIC INTERFERENCE

Yukio Tsuneki, Tachikawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Oct. 20, 1987, Ser. No. 110,344

Claims priority, application Japan, Oct. 24, 1986, 61-252876

Int. Cl.[4] H05K *1/16*

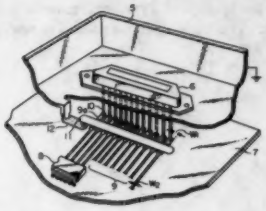
U.S. Cl. 361—406 **4 Claims**

1. In an electronic apparatus having a printed circuit board including a circuit for inputting and outputting electric signals between an external apparatus separate from said electronic apparatus and an internal circuit on the printed circuit board through a connector, the circuit for inputting and outputting signals comprising:

a first conductive pattern electrically connecting the connector and the internal circuit on the printed circuit board;

a second conductive pattern connected to a ground potential; and

a condenser connected between the first conductive pattern at a point of contact and the second conductive pattern, wherein a portion of the first conductive pattern between said point of contact with said condenser and said connector is wider than a portion of the first conductive pattern



between said point of contact with said condenser and said internal circuit on the printed circuit board.

4,908,736

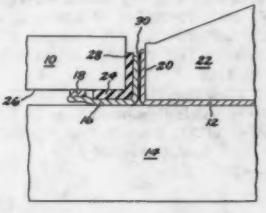
SELF PACKAGING CHIP MOUNT

Harold F. Webster, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 128,847, Dec. 4, 1987, Pat. No. 4,796,156. This application Aug. 23, 1988, Ser. No. 235,087

Int. Cl.[4] H05K *3/30*

U.S. Cl. 361—408 **2 Claims**



1. An integrated circuit chip assembly for use in a self packaging chip mount, comprising:

an integrated circuit chip, said integrated circuit chip having side surfaces and terminals on a bottom side;

a compliant backing member disposed about, and in contact with, a periphery of said bottom and side surfaces of said integrated circuit chip; and

conductive leads secured to said terminals and extending over said compliant backing member on both the said bottom side and side surfaces.

4,908,737

MOUNTING STRUCTURE OF A SMALL-SIZED ACOUSTIC COMPONENT

Takashi Murakami, and Kunitoshi Yoshitake, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,343

Claims priority, application Japan, Dec. 8, 1987, 62-187394[U]

Int. Cl.[4] H05K *5/00*

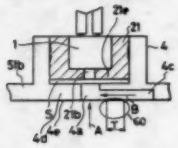
U.S. Cl. 361—419 **25 Claims**

1. A mounting structure for mounting an acoustic apparatus in a casing of an electronic device, comprising:

mounting means formed integrally with the casing of the electronic device, said mounting means having a first cylindrical opening and a mounting plate, said mounting plate having a first sound path aperture formed in substantially the center of said mounting plate and a sound path groove extending from said sound path aperture along a portion of a bottom surface of said mounting plate;

a net member positioned on a top surface of said mounting plate of said mounting means, said net member having water repellant properties; and

spacer means formed of a resilient material and inserted into said first cylindrical opening of said mounting means, said



spacer means having a second cylindrical opening and a spacer plate, said spacer plate having a second sound path aperture formed in substantially the center of said spacer plate and positioned adjacent to said first sound path aperture, said second cylindrical opening being formed for receiving the acoustic apparatus.

4,908,738

DRIVED MOTOR CONTROL UNIT

Katsuo Kobari, Tachikawa; Naoto Ota, Yamanashi; Naoyuki Suzuki, Yamanashi, and Yuji Kanamori, Yamanashi, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

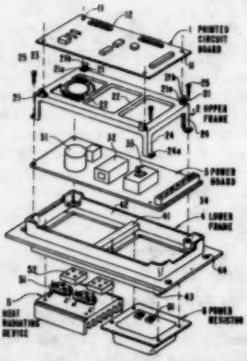
PCT No. PCT/JP87/00995, § 371 Date Jul. 8, 1988, § 102(e) Date Jul. 8, 1988, PCT Pub. No. WO88/04879, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 18, 1987, Ser. No. 233,652

Claims priority, application Japan, Dec. 19, 1986, 61-303021; Dec. 19, 1986, 61-303022; Dec. 19, 1986, 61-303023

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—429 **8 Claims**



1. A drive motor control unit

including electrical components, which include control circuit components and power circuit components, to be used in controlling an AC motor, comprising:

a control circuit board mounting said control circuit components;

a first frame having a top, a central space, and a plurality of legs extending downwardly from the top and supporting the control circuit board on said top;

a connecting power distribution board having upper and lower surfaces and

mounting said power circuit components; and

a second frame having an upper surface, a lower surface, and a central space, the connecting power distribution board being connected to the upper surface, said

first frame being connected to said second frame to support said control circuit board over said connecting power distribution board;

at least some of the power circuit components being electrically connected to the lower surface of the connecting power distribution board and being mechanically supported by the lower surface of the second frame.

4,908,739

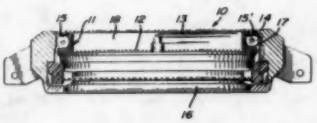
LIGHT DIFFUSING RING FOR WRISTWATCH

André Brien, 1390 Boul. De La Concorde W., Apt. 408, Laval-des-Rapides, Quebec, Canada H7N 5P5

Continuation of Ser. No. 170,870, Sep. 29, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,743

Int. Cl.[4] G01D *11/28*

U.S. Cl. 362—23 **11 Claims**



1. A light diffusing ring for positioning in a wristwatch immediately about the circumference of a time display face thereof and under a transparent cover to illuminate said face, said ring being constructed of light transmitting material, said ring having top and bottom parallel walls and an inner side wall, an elongated cavity formed in an outer side wall of said ring and extending at least in one quarter of the circumference of said ring, said cavity having a cross-sectional dimension to receive a lamp in close fit therein, said lamp having end terminals disposed over an outside side wall of said lamp adjacent opposed ends thereof, means to hold said terminals in position in said channel with said terminals in friction electrical contact with battery circuit contacts providing a voltage across said lamp to illuminate same for transmitting light along said ring to reflect and illuminate said time display face.

4,908,740

INTEGRAL COMPOSITE STRUCTURE WITH PREDETERMINED ELECTRICALLY CONDUCTIVE NETWORKS AND METHOD FOR PRODUCING SAME

Richard D. Hudgins, 3217 Olive Hill Rd., Fallbrook, Calif. 92028, and Scott Carr, 6355 Smith Ave., Mira Loma, Calif. 91752

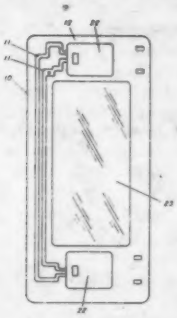
Filed Feb. 9, 1989, Ser. No. 309,826

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—144 **19 Claims**

1. An integral composite structure having predetermined electrically conductive networks on a relatively non-electrically conductive preformed support structure, said composite structure being formed by the combination of a slurry containing electrically conductive materials having a fluid carrier which includes an evaporative fluid and an elastomeric substance in which particles of an electrically conductive material are mixed, said fluid carrier containing elements which are chemically reactive with the material forming the relatively non-electrically conductive preformed support structure so that following the combination of the slurry with the preformed support structure the fluid carrier reacts chemically with the preformed support structure to form a bond therebe-

tween and upon evaporation of the fluid portion of the ink, a residue remains forming a flexible and electrically conductive



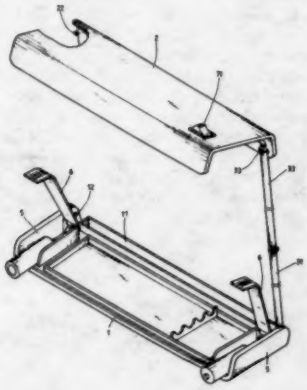
material arranged in a desired pattern secured to the preformed support structure.

4,908,741

DESK LAMP-CONVERTIBLE PENCIL BOX

Kuo H. Hwang, 115, Kuo Tze Lih, Pei Twen District, Taichung, Taiwan

Filed Jun. 1, 1989, Ser. No. 359,966
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—154 **2 Claims**



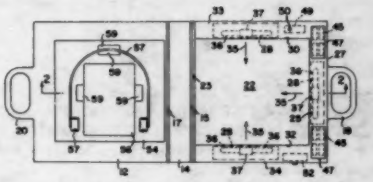
1. A desk lamp-convertible pencil box comprising:
a box seat;
a box cover; and
a pivot member having a first pivot rod and a second pivot rod, said first pivot rod being pivoted to said box seat and said second pivot rod pivotally connecting said first pivot rod to said box cover, said box seat having two battery containers and a long groove for receiving said pivot member, said box cover having lamp sockets, and a set of wires being disposed on said box seat and through said pivot member to electrically connect said battery containers and lamp sockets to form a circuit, a switch being further disposed on said box cover to control the opening and closing of the circuit, whereby when batteries and lamps are installed respectively in the battery containers and lamp sockets, the lamps can be lighted up via said switch with said box cover pivoted upward to convert the pencil box into a desk lamp.

4,908,742

PORTABLE DESK UNIT

Denise A. Kersey, 1708 Walpole Pl., Modesto, Calif. 95351

Filed May 22, 1989, Ser. No. 354,758
Int. Cl.[4] A45C *15/06*
U.S. Cl. 362—156 **8 Claims**



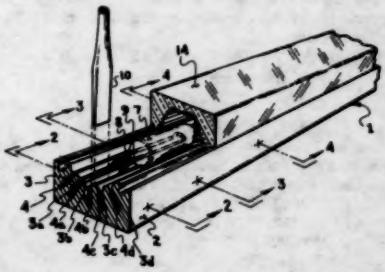
1. A portable writing box comprising a first rectangular panel, a second rectangular panel, a connector strip hingedly connected to adjacent edge areas of said panels, whereby the panels can be oriented in a common horizontal plane or in different horizontal planes one above the other;
said first panel having one edge thereof hindedly attached to the connector strip, and three other free eges; three hood structures carried on one face of said first panel in near proximity to said three other edges, each said hood structure extending along substantially the entire length of the associated panel free edge.
a writing surface means carried on said one face of said first panel in the space circumscribed by said one panel edge and said three hood structures; and an electric illumination means located in each hood structure; each illumination means comprising at least one electric lamp and a reflector mounted within the associated hood structure to direct light rays toward a central point on the writing surface means, whereby shadows on the writing surface are substantially eliminated.

4,908,743

STRIP LIGHTING ASSEMBLY

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Jun. 15, 1989, Ser. No. 366,637
Int. Cl.[4] F21V *1/00*
U.S. Cl. 362—238 **19 Claims**



1. A low voltage strip lighting assembly including:
an elongated flexible insulator strip having a base including two sides and a top surface;
a plurality of elongated slits in said insulator strip and generally normal to the top surface;
a plurality of flat electrical conductors disposed within the slits in the insulator strip;
a plurality of miniature wire terminal lamp bulbs, each having a first wire terminal and a second wire terminal, said light bulbs being disposed adjacent to the top surface of

the insulator strip and each terminal of each light bulb extending from the top surface of the insulator strip into a slit in the insulator strip to electrically contact one side surface of a respective flat conductor at any point along the length of the insulator strip, whereby the application of electrical power from an external source to each of the respective conductors will light the bulbs;

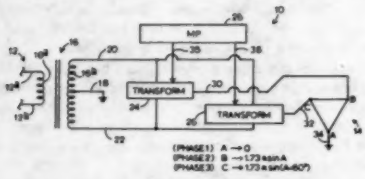
a generally U-shaped lens covering the light bulbs and having depending legs engaging the sides of the base of the elongated insulator strip.

4,908,744

FREQUENCY-INDEPENDENT SINGLE-PHASE TO THREE-PHASE AC POWER CONVERSION

Theodore G. Hollinger, Redmond, Oreg., assignor to APC-Onsite, Inc., Redmond, Oreg.

Filed May 10, 1989, Ser. No. 353,379
Int. Cl.[4] H02M *5/00*
U.S. Cl. 363—4 **8 Claims**



1. Apparatus for supplying to a three-phase electrical load including first, second and third input terminals, operating power from a power source including two output terminals, comprising

algorithm-controlled computer means,

first transform means operatively connected to said computer means, to such two output terminals, and to the first of such input terminals, for deriving power from the output terminals and for supplying to the first input terminal under the control of said computer means, a sinusoidal voltage artifact having the form of 1.73α Sin A, where α is the amplitude of the voltage, and A is the phase angle,

second transform means operatively connected to said computer means, to such two output terminals, and to the second of such input terminals, for deriving power from the two output terminals and for supplying to such second input terminal, under the control of said computer means, a sinusoidal voltage artifact having the form of 1.73α Sin $(A+60°)$, and

ground means grounding the load's third input terminal.

4,908,745

SEQUENCE CONTROLLER

Yoji Ichiyasu, Narasino; Katuhiro Fujiwara, Sakura; Oshiga Takayasu, and Toshiro Kasahara, both of Narasino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00757, § 371 Date Aug. 5, 1988, § 102(e) Date Aug. 5, 1988, PCT Pub. No. WO88/02883, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 7, 1987, Ser. No. 236,524
Claims priority, application Japan, Oct. 8, 1986, 61-238076
Int. Cl.[4] G06F *15/46, 9/00*
U.S. Cl. 364—140 **6 Claims**

1. A sequence controller comprising:

a program storage means for storing a sequence program;

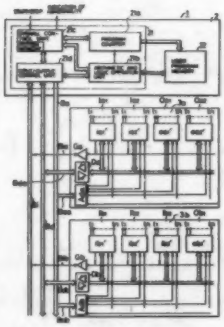
external signal input terminals divided into multiple blocks, at least one block being subdivided into multiple groups, each group consisting of multiple terminals;

an arithmetic and logic operation means having a timing signal generating circuit for producing a timing signal, the arithmetic and logic operation means being adapted to perform logic operation on two or more signals including the external signals taken in from the external signal input terminals, according to a sequence program read out from the program storage means in synchronism with the timing signal;

an output means for outputting a control signal according to the result of operation performed by the arithmetic and logic operation means;

first signal generating means for outputting a first signal when a signal calling for an interrupt processing comes to a group of the external signal input terminals;

second signal generating means for outputting a second signal when one of the blocks outputs the first signal;



a second signal transfer means for informing the arithmetic and logic operation means that the second signal has occurred in one of the blocks; and

an access means by which the arithmetic and logic operation means when informed by the second signal transfer means of the occurrence of the second signal stops its logic operation required by the sequence program, accesses the second signal generating means successively and, when it finds the block that has produced the second signal, successively accesses the first signal generating means belonging to that block to identify the unit which has outputted the first signal.

4,908,746

INDUSTRIAL CONTROL SYSTEM

Mitchell D. Vaughn, Garland, Tex., assignor to United States Data Corporation, Richardson, Tex.

Filed Oct. 15, 1986, Ser. No. 919,060
Int. Cl.[4] G05B *17/02*
U.S. Cl. 364—147 **16 Claims**

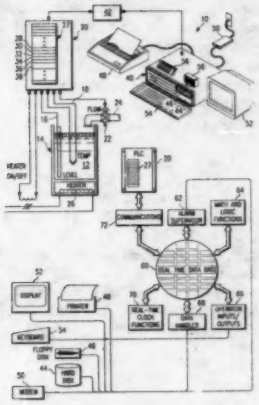
1. A control system for controlling and monitoring electronically controlled equipment comprising:

control means including a plurality of programs each having associated local storage memory, each of said programs operable to be executed independently of other of said programs to produce output data;

a database memory comprising a plurality of memory elements for storing said output data; and

database managing means operable to transfer data stored in

one of said memory elements to one of said programs only if the data stored in said memory element has changed



since a previous transfer to the local memory of said program of the data stored in said element.

4,908,747

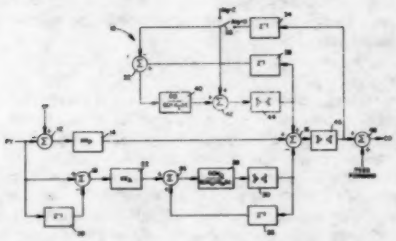
ADVANCED PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE CONTROLLER

John D. Lane, McLean, Va.; Theodore N. Matsko, Chesterland; Joseph G. Patella, Mentor, and Thomas J. Scheib, Chesterland, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 21, 1988, Ser. No. 170,509

Int. Cl.[4] G05B *11/42*; G06G *7/66*

U.S. Cl. 364—162 **9 Claims**



1. Apparatus for producing an interacting proportional, derivative, and integral process control signal from a process variable signal or a proportional, derivative and external reset signal from a process variable signal comprising:

means for converting the process variable signal into a first signal which is proportional to said process variable signal;

means for converting the process variable signal into a second signal which is a function of the derivative of said process variable signal;

means for converting the process variable signal into a third signal which is a function of the integral of said process variable signal;

means for combining said first, second and third signals to produce said process control signal;

switch means for removing said third signal from said combining means and replacing third signal with an external reset signal; and

wherein variation of any one of said first, second and third signals causes a variation in the remainder of said first, second and third signals as per an interacting algorithm.

4,908,748

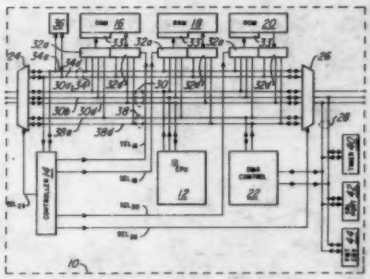
DATA PROCESSING DEVICE WITH PARALLEL CIRCULAR ADDRESSING HARDWARE

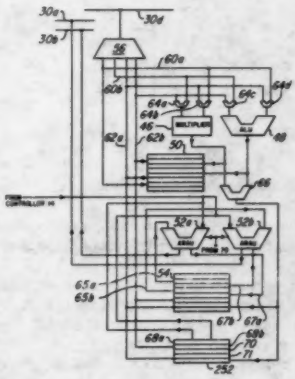
Bimal Pathak, Stafford; Steven P. Marshall, Missouri City, and James F. Potts, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 28, 1987, Ser. No. 78,350

Int. Cl.[4] G06F *5/00*

U.S. Cl. 364—200 **10 Claims**





1. A microcomputer for enhanced addressing flexibility, comprising:

a first arithmetic logic unit, for performing operations upon data responsive to predetermined instruction codes;

a memory, having addressable locations therein, for storing data;

a memory bus, connected to said first arithmetic logic unit and to said memory, for communicating data therebetween;

a block size register for storing a data word indicative of the number of addressable locations in a predetermined block of said memory;

a memory address register for storing a data word indicative of a memory address; and

a first auxiliary arithmetic logic unit, connected to said block size register, to said memory address register, and to said memory, for calculating a new memory address from the contents of said memory address register and a predetermined index value, for comparing said new memory ad-

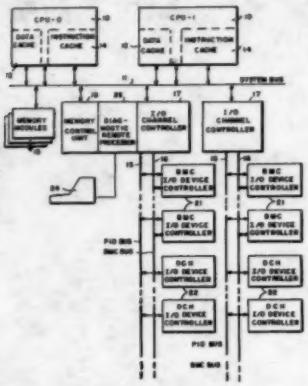
dress and the contents of said block size register, and for modifying said new memory address in a predetermined manner responsive to said comparison between said new memory address and the contents of said block size register.

4,908,749

SYSTEM FOR CONTROLLING ACCESS TO COMPUTER BUS HAVING ADDRESS PHASE AND DATA PHASE BY PROLONGING THE GENERATION OF REQUEST SIGNAL

Peter G. Marshall, and Robert Feldstein, both of Grafton, Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 15, 1985, Ser. No. 798,595
Int. Cl.[4] G06F *13/42, 13/38, 13/18*
U.S. Cl. 364—200 **16 Claims**



2. A computing system comprising:

a system bus;

a plurality of requesters connected to said system bus, each requester having a different level of priority to access said bus;

means connected to said system bus for providing a system clock defining a succession of clock cycles;

means at each of said requesters for driving a system busy signal on said system bus;

means in at least one of said requesters for generating a first request signal corresponding to the priority of the requester during a clock cycle when the at least one requester wants to drive an instruction having an address phase of at least two clock cycles followed by a data phase on said system bus and when said system busy signal is not being driven on said system bus, said first request signal causing said driving means of the at least one requester to drive a system busy signal on said system bus;

means at each of said requesters responsive to said system busy signal for inhibiting the generation of its respective request signal when its respective request signal is not already being generated; and

means at said at least one of said requesters for prolonging the generation of its first request signal and driving of the system busy signal until the clock cycle in which said at least one of said requesters starts driving the instruction on said system bus, said prolonging means including:

means for receiving request signals from other of said requesters on said system bus;

means, connected to receive its first request signal from its said generating means, for generating a priority signal in a clock cycle as soon as its first request signal has been generated and no higher priority request signals are being received from said other of said requesters;

means for generating a drive freeze signal in response to said priority signal and other signals from said system bus which indicate an address phase of an instruction from another of said requesters has been completed; and

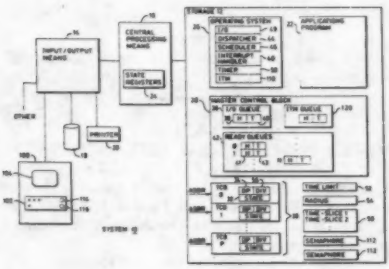
means responsive to the first request signal and the absence of the drive freeze signal for prolonging the generation of the first request signal and the driving of the system busy signal until the drive freeze signal is generated.

4,908,750

DATA PROCESSING SYSTEM HAVING TUNABLE OPERATING SYSTEM MEANS

Charles E. Jablow, Somerville, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation-in-part of Ser. No. 707,340, Mar. 1, 1985, Pat. No. 4,736,318. This application Dec. 11, 1985, Ser. No. 807,622
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **9 Claims**



1. A multiprogrammed computer system in which a plurality of tasks are executing concurrently, each task having an associated dispatch priority value signal, said computer providing

a central processor,

timing means for awaiting completion of a defined time interval,

queue storage means for representing a plurality N of ready queues comprising representations of tasks queued for control of said central processor, each queue having a queue priority, said queue priorities together with the positions of the task representations within said queues together identifying a next task to be given such control,

dispatching means responsive to said queue storage means for giving said next task control of said central processor, and for setting said timing means,

queue subset limit signal storage means for providing ready queue subset limit signals defining for each task a subset of M particular ready queues, M being less than N, said subset including highest and lowest priority ready queues for that task, the ready queue subset of any concurrent task having at least one queue in common with the ready queue subset of any other concurrent task, providing overlapped ready queue subsets,

operating system means including inter-task message facility means for communicating among said concurrently executing tasks, said operating system means being responsive to said central processor and said timing means for detecting a request by a task controlling the central processor for service by said inter-task message facility means before the completion of a said defined time interval and associating with such task an improved dispatch priority value, and for detecting when a dispatched task has controlled said central processor for a time period at least equal to said defined time interval and for associating with such

task a worsened dispatch priority value, said improved and worsened values being subject to said ready queue subset limit signals,

said computer system further providing scheduler means responsive, for each task awaiting control of said central processor, to its said associated dispatch priority value and to said task queue subset limit signals for placing a representation of said task in a particular ready queue within said ready queue defined for said task.

4,908,751

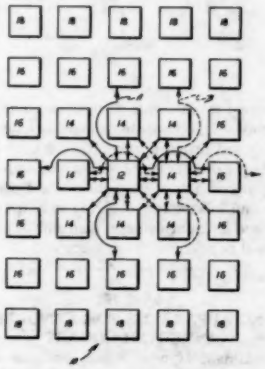
PARALLEL DATA PROCESSOR

Harry F. Smith, Seven Fern La., Newtown, Conn. 06470

Filed Oct. 15, 1987, Ser. No. 108,774

Int. Cl.[4] G06F *13/00*; G06K *9/56*; G06G *9/00*

U.S. Cl. 364—200 **20 Claims**



1. A data processing system for simultaneously processing a plurality of data words, the data words being provided by means for generating data words coupled to the system for inputting data words to be processed thereto, the system comprising:

one or more data processing planes each of which comprises plurality of processing elements logically organized in rows and in columns as a two-dimensional array of processing elements, each of said processing elements comprising means for performing arithmetic and logical operations on data words in a simultaneous manner with others of said processing elements; and wherein

each of said processing elements within a given plane of processing elements is operatively coupled to all processing elements within immediately adjacent rows and columns of said given plane for transferring data therebetween and is also further operatively coupled to a plurality of processing elements disposed in non-immediately adjacent rows and columns of said given plane for transferring data therebetween.

4,908,752

DC-TO-DC VOLTAGE-INCREASING POWER SOURCE

Eiichi Suzuki; Kenji Yokoyama, and Masao Noro, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Filed Mar. 24, 1989, Ser. No. 328,182

Claims priority, application Japan, Mar. 25, 1988, 63-71170

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—17 **10 Claims**

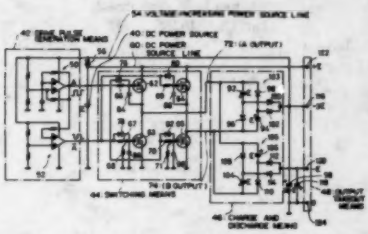
1. A DC-to-DC voltage-increasing power source comprising:

a DC power source;

drive pulse generation means for generating drive pulses which are in 180 degree phase relationship;

switching means of a push-pull construction supplied with operating voltage from said DC power source and driven between an on-state and an off-state in response to the drive pulses;

charge and discharge means comprising capacitors charged by being connected in parallel to said DC power source during one operation phase of said switching means and discharging a sum voltage of voltage of said DC power source and voltage of the charged capacitors by being



connected in series to said DC power source during the other operation phase of said switching means; and

output takeout means for taking out the sum voltage discharged from said charge and discharge means as a voltage-increased DC output,

said switching means being constructed of voltage-controlled type elements whose on-state is changed in response to the level of an on-pulse in the drive pulses, and

said drive pulse generation means comprising pulse level changing means for changing the level of the on-pulse in the drive pulses.

4,908,753

HIGH-TENSION POWER SUPPLY FOR AN IMAGE RECORDER

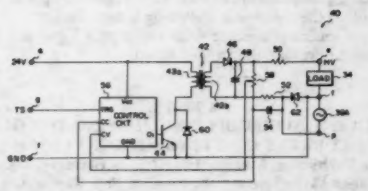
Tsunehide Takahashi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,266

Claims priority, application Japan, Mar. 9, 1988, 63-53733

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **3 Claims**



1. A high-tension power supply supplied with a DC voltage for outputting a high DC voltage or a high AC voltage comprising:

switching means for switching the supplied DC voltage;

a transformer for boosting the switched voltage;

terminal means having a high-voltage side output terminal, a low-voltage side output terminal, and a ground terminal which are connected to a secondary winding of said transformer; and

diode means connected between said low-voltage side terminal and said ground terminal;

said low-voltage side terminal and said ground terminal constituting a connection for an ammeter;

said diode means having a forward potential higher than a potential difference of said ammeter.

4,908,754

TRIGGER AND CONTROL MEANS FOR BRIDGE INVERTER

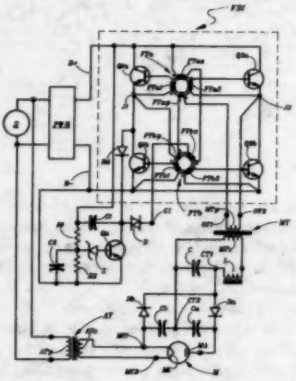
Ole K. Nilsen, Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 679,929, Dec. 10, 1984, Pat. No. 4,680,506. This application Apr. 21, 1987, Ser. No. 40,809

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[4] H02M *5/458*

U.S. Cl. 363—37 **20 Claims**



1. An arrangement comprising:

a source of DC voltage;

bridge inverter means connected with the source of DC voltage and operative, but only when the magnitude of the DC voltage exceeds a threshold level and then only after having been provided with a trigger signal at a trigger input, to self-oscillate by way of positive feedback means and to provide an output of AC voltage at a pair of output terminals, the inverter means having a first and a second pair of electronic switching means, each electronic switching means having a control input, the trigger input being connected in circuit with the control input of at least two of the electronic switching means; and

trigger means connected with the trigger input and operative to provide the trigger signal.

4,908,755

METHOD AND CIRCUIT FOR LIMITING THE OUTPUT CURRENT OF A FLYBACK CONVERTER

Martin Feldtkeller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 328,962

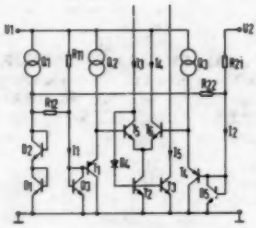
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810224

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—56 **6 Claims**

1. Method for limiting the output current of a power supply with a self oscillating flyback converter, by controlling a primary peak current as a function of input and output voltages of the flyback converter, which comprises forming a quotient from two given input variables and multiplying the quotient by a first constant, adding a second constant thereto and then multiplying by a third constant; defining the two input variables by the input and output voltage of the flyback converter; dividing the output voltage of the flyback converter by the input voltage of the flyback converter in the quotient formation; providing the output variable as a manipulated variable for regulating the primary peak current; and simulating a formal dependency existing in the flyback converter between the input and output voltages and the primary peak current of the flyback converter by dimensioning the three constants.

4. Circuit for limiting the output current of a power supply with a self oscillating flyback converter, by controlling a primary peak current as a function of input and output voltages of the flyback converter, comprising an analog calculating circuit for controlling the primary current, said analog calculating circuit including a divider stage with given amplification over which the input and output voltages of the flyback converter are applied, a multiplier stage receiving an output signal of said divider stage and an input value, and an adding stage receiving an output signal of said multiplier stage and the input value.



4,908,756

DETECTING APPARATUS FOR ABNORMALITY IN INVERTER CIRCUIT

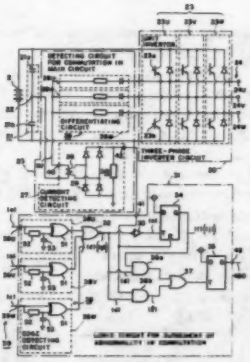
Shigenori Higashino, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,260

Claims priority, application Japan, Apr. 10, 1987, 62-89556

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—58 **6 Claims**



1. A detecting apparatus for detecting abnormality in an inverter comprising:

an inverter circuit for inverting power in a DC circuit into that in an AC circuit and vice versa based on a command signal for commutation,

a detecting circuit for detecting commutation in the inverter circuit, the detecting circuit being comprised of a current detecting circuit provided between a voltage dividing point of said DC circuit and said inverter circuit and

provided with its one end connected to said voltage dividing point and a differentiating circuit connected between the other end of the current detecting circuit and an AC terminal of said inverter circuit, and

a logic circuit for judgement of abnormality in commutation, the logic circuit comparing a detected signal of said detecting circuit for commutation in the main circuit with a command signal for commutation for commanding its commutation to said inverter circuit, and, at the same time, detecting inconsistency in logics of said detecting signal and said command signal for commutation within an arbitrary time period.

4,908,757

STATIC FREQUENCY CONVERTER, ESPECIALLY A FREQUENCY CONVERTER CONTROLLING AND/OR ADJUSTING THE PERFORMANCE DATA OF AN ELECTROMOTOR

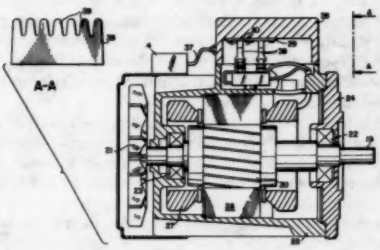
Niels D. Jensen, and Jorgen Christensen, both of Bjerringbro, Denmark, assignors to Grundfos International A/S, Denmark

Continuation of Ser. No. 131,803, Dec. 11, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,099

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642723

Int. Cl.[4] H02M *1/00*

U.S. Cl. 363—141 **3 Claims**



1. A pump assembly comprising an electromotor, a rotor chamber for receiving fluid to be circulated, an additional chamber which also receives said fluid to be circulated and communicates with said rotor chamber, a housing which surrounds said electromotor and defines said additional chamber, a heat conductive casing arranged in said additional chamber, a frequency converter comprising an input circuit and an output circuit arranged inside said casing, said input circuit being coupled to a power source and said output circuit being electrically coupled to said electromotor, and heat conductive and electrically insulative filler means which fill the remaining space inside said casing, said casing being in thermal contact with and sealed from said fluid in said additional chamber, whereby said filler means conducts heat from said input and output circuits to said casing, and said casing thereafter dissipates said heat to said fluid to be circulated.

4,908,758

METHOD OF OPERATING A COMPUTER FOR RANK ORDERING AND WEIGHTING CATEGORY ALTERNATIVES

Michael J. Sanders, 14732 W. 90th Ter., Lenexa, Kans. 66215

Filed Dec. 17, 1987, Ser. No. 133,959

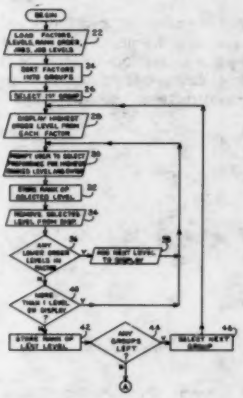
Int. Cl.[4] G06F *7/00, 7/24*

U.S. Cl. 364—300 **10 Claims**

1. A user-interactive method of operating a computer for producing an overall ranking of data items such as job factor levels, alternatives, and the like making up a data set, the computer including a memory for storing data including said data set, an input device for entering data, and an output device for displaying data, said method comprising the steps of:

(a) storing said data set in said memory whereby said data items included in said data set are arranged into a plurality of categories with the data items included in each category having a category rank relative to one another and presenting a pair of terminal items respectively representing the highest and lowest ranked items in the category;

(b) retrieving from the memory and displaying on the output device a data display including a terminal data item of corresponding category rank from selected ones of the categories;



(c) entering into the computer data representative of the user's selection of the one of the items included in said display;

(d) assigning in the computer a sequential rank to said user's selection and storing said sequential rank in the memory;

(e) retrieving from the memory a previously non-displayed replacement data item from the same category as said selection and nearest in category rank to said selection, and replacing said selection on said display with said replacement data item; and

(f) repeating steps (c) and (e) until a sequential rank has been assigned and stored for each item from said selected ones of the categories thereby producing an overall ranking of the data items thereof.

4,908,759

HIERARCHICAL DATABASE CONVERSION WITH CONDITIONAL WRITE

Everett L. Alexander, Jr., Edison Township, Middlesex County; Allan R. Carlin, East Brunswick Township, Middlesex County; Alice L. Fiore, Edison Township, Middlesex County, and Walter A. Mackiewicz, South Plainfield, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Continuation of Ser. No. 770,699, Aug. 29, 1985, abandoned. This application Jan. 21, 1988, Ser. No. 147,319

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—300 **5 Claims**

1. In a computer system having a memory and storage device, an improved method for transitioning an input hierarchical database serving as a system input to obtain an output hierarchical database, the method including the steps of

generating and storing in the memory: (i) an input dictionary defining the contents of the input database; (ii) an output dictionary defining the contents of the output database, the contents including records composed of segments; and (iii) a map table having entries defining the correspon-

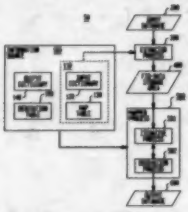
dence between the input database contents and the memory,

identifying, with reference to the input dictionary and the map table, the contents of the input database selected for transitioning, extracting the selected contents from the input database, and storing the extracted contents in the device in hierarchical sequence as identifier-data pairs, and

sequentially processing the identifier-data pairs with reference to the input dictionary, the output dictionary and the map table, and storing data associated with each identifier as associated data in the memory,

wherein the improvement to the method comprises the steps of

before the step of processing, generating and storing derivation table entries in the memory, each of said entries specifying computer instructions to generate the final contents of the output database from the associated data, wherein one of said instructions: supplies comparison information



expressed in terms of the associated data; and conditionally writes to the device a subset of the associated data needed to complete a corresponding subset of the output database, said conditional write executable whenever a comparison between said comparison information and the next incoming identifier in the sequence of identifier-data pairs is satisfied,

before the step of processing, augmenting predetermined map table entries with preselected ones of said derivation table entries callable during the step of processing, and

upon a call to said conditional write during the step of processing, performing said comparison and, when satisfied, executing said conditional write to generate said subset of the associated data and then storing said subset of the associated data in the device,

whereby the improvement effects the transitioning of a large input database by a computer system having insufficient memory to store data for all segments of an output database record until all transitioning operations are completed.

4,908,760

SELF-CLEANING OVEN TEMPERATURE CONTROL HAVING MULTIPLE STORED TEMPERATURE TABLES

Richard E. Sinn, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 31, 1987, Ser. No. 140,042

Int. Cl.[4] H05B *1/02*

U.S. Cl. 364—400 **5 Claims**

1. A self-cleaning oven comprising

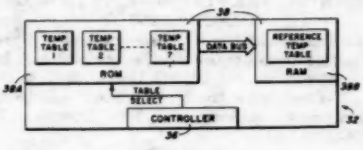
an oven cavity adapted to receive items to be cooked by said oven,

heating means within said oven for raising the temperature of said oven cavity and

control means for controlling the operation of said oven in a BAKE mode of operation and in a CLEAN mode of operation,

said control means including oven cavity sensing means for sensing the temperature of said oven and also including desired temperature indicating means for indicating the user selected desired oven cavity bake temperature from a range of bake temperatures and also including automated means for automatically controlling the operation of aid heating means in said BAKE and CLEAN modes of operation,

said automated means including memory means for storing a plurality of look-up tables, each of said tables including a unique set of values corresponding either to oven cavity temperatures expected to be detected by said sensing means or to said range of bake temperatures, said memory means including first memory means for storing said plurality of look-up tables and also including alterable memory means for receiving and storing one of said look-up tables for use by a microprocessor in automatically controlling the operation of said heating means in said BAKE mode,



said control means further including settable means for indicating to said automated means a particular recalibrated oven type from a plurality of different recalibrated oven types, the number of said plurality of look-up tables being at least equal to the number of said plurality of recalibrated oven types,

said automated means further including said microprocessor for automatically controlling the operation of said heating means in said BAKE mode in response to input signals from said sensing means and from said desired temperature indicating means and from said settable means,

said one of said look-up tables being determined by the state of said settable means.

4,908,761

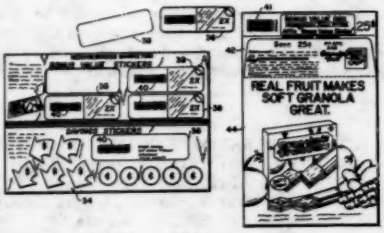
SYSTEM FOR IDENTIFYING HEAVY PRODUCT PURCHASERS WHO REGULARLY USE MANUFACTURERS' PURCHASE INCENTIVES AND PREDICTING CONSUMER PROMOTIONAL BEHAVIOR RESPONSE PATTERNS

Roland Tal, Yorktown Heights, N.Y., assignor to Innovare Resourceful Marketing Group, Inc., Yorktown Heights, N.Y.

Filed Sep. 16, 1988, Ser. No. 245,818

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—401 **26 Claims**



6. A system for identifying by name and address those consumers who are the heaviest product purchasers who regularly use cents-off coupons, said system comprising:

(a) preparing an initial list of names and addresses of consum-

ers who are the most likely heaviest product purchasers who are regular cents-off coupon users;

(b) delivering to those consumers on said initial list a plurality of redeemable cents-off coupons in a unit on a plurality of consumer products with at least one consumer activated encoding device indicating the name and address of the receiving consumer in machine readable language, each of said at least one consumer activated encoding device being adapted for physical association with a cents-off coupon;

(c) receiving for redemption from receiving consumers those cents-off coupons submitted for redemption including those physically associated with said consumer activated encoding devices;

(d) machine reading and recording the names and addresses of receiving consumers that redeem the cents-off coupons physically associated with said consumer activated encoding devices; and

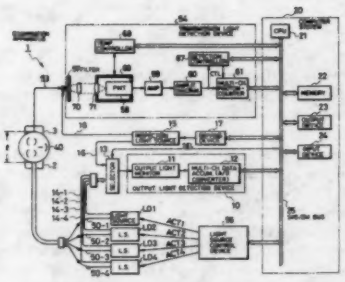
(e) recreating out of said initial list a list of names and addresses of the heaviest product purchasers who regularly use cents-off coupons.

4,908,762

OXIMETER WITH SYSTEM FOR TESTING TRANSMISSION PATH

Susumu Suzuki; Sumio Yagi; Naotoshi Hakamata, and Takeo Ozaki, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 2, 1988, Ser. No. 188,910
Claims priority, application Japan, May 8, 1987, 62-110471
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413.09 **9 Claims**



1. An examination apparatus for measuring the oxygenation in an object with electromagnetic wave transmission spectrophotometry, comprising:

a light source means for sequentially emitting electromagnetic waves housing different wavelengths;

an illumination-side fixture for receiving said electromagnetic waves emitted from said light source means and outputting said electromagnetic waves;

a detection-side fixture for detecting electromagnetic waves output from said illumination-side fixture and for sending said transmitted electromagnetic waves to a transmission light detection means;

said transmission light detection means for detecting electromagnetic waves sent from said detection-side fixture and for outputting path-transmission light data; and

a computer system for receiving said path-transmission light data from said transmission light detection means and for judging whether said examination apparatus is in an optimum condition on the basis of said path-transmission light data: wherein

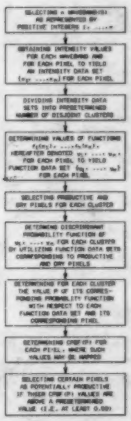
said illumination-side fixture and said detection-side fixture have such structures that said fixtures can be assembled together so that electromagnetic waves output from said illumination-side fixture are directly made incident on and detected by said detection-side fixture and said computer system includes a memory means for storing previously obtained optimum path-transmission light data and includes a processor means for comparing said path-transmission light data to said previously obtained optimum path-transmission light data.

4,908,763

SPECTRAL DATA PROCESSING METHOD FOR DETECTION OF HYDROCARBONS

Kenneth R. Sundberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 9, 1988, Ser. No. 242,942
Int. Cl.[4] G01V *5/00, 5/02*
U.S. Cl. 364—420 **16 Claims**



1. A method of processing spectral data for a preselected set of pixels which correspond to adjacent areas of the earth's surface comprising:

(a) selecting n waveband(s) as represented by the positive integers 1, . . . n;

(b) obtaining intensity values for each waveband with respect to electromagnetic radiation reflected from areas of the earth's surface corresponding to each pixel so as to yield an intensity data set $\{x_1, \ldots, x_n\}$ for each pixel where $x_1, \ldots, x_n$ correspond to the intensity values for respective wavebands 1, . . . , n;

(c) dividing said intensity data sets into a predetermined number of disjoint data set clusters, wherein any one intensity data set is contained in only one cluster;

(d) determining the value of each of monotonic functions $f_1(x), \ldots, f_n(x)$, where x represents intensity, for each respective waveband for each pixel in each cluster so as to yield a function data set $\{f_1(x_1), \ldots, f_n(x_n)\}$ for each pixel in each cluster, wherein $f_1(x_1), \ldots, f_n(x_n)$ are hereinafter denoted as $y_1, \ldots, y_n$ respectively;

(e) selecting certain productive pixels and dry pixels, associated with each of the clusters, previously determined to correspond to hydrocarbon-bearing and nonbearing areas of the earth's surface respectively;

(f) determining a discriminant probability function, being a function of $y_1, \ldots, y_n$, for each cluster by utilizing the function data sets corresponding to the productive pixels and dry pixels associated with each respective cluster;

(g) determining for at least one cluster the value P of its corresponding discriminant probability function with respect to at least one function data set and its corresponding pixel, said value of the discriminant probability function being indicative of the probability of the presence of hydrocarbons;

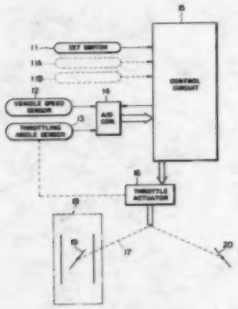
(h) determining said at least one pixel to be either potentially productive or dry with respect to hydrocarbons based on its corresponding discriminant probability function value.

4,908,764

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING A VEHICLE SPEED TO A DESIRED CRUISING SPEED

Yoshiyuki Etoh, Kanagawa, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Jan. 21, 1988, Ser. No. 146,558
Claims priority, application Japan, Jan. 23, 1987, 62-7565[U]
Int. Cl.[4] B60K *31/04*
U.S. Cl. 364—426.04 8 Claims



1. A system for automatically controlling a vehicle speed to a desired cruising speed, comprising:

(a) first means for measuring the vehicle speed;

(b) second means for setting the vehicle speed to the desired target cruising speed according to a driver's intention;

(c) third means for controlling an engine input variable which is correlated to an engine output of a vehicle in which the system is mounted on the basis of a manipulated variable so that the vehicle speed coincides with the target cruising speed;

(d) fourth means for calculating a basic manipulated variable on the basis of the measured vehicle speed and desired target cruising speed set by said second means;

(e) fifth means for measuring the input variable of the engine output;

(f) sixth means for calculating a transfer function of a response of the engine input variable to a change in the manipulated variable; and

(g) seventh means for correcting the basic manipulated variable on the basis of the transfer function calculated by the sixth means and setting and outputting the corrected manipulated variable to the third means.

4,908,765

AIR/FUEL RATIO CONTROLLER FOR ENGINE

Nobuaki Murakami, and Osamu Hirako, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,618
Claims priority, application Japan, Nov. 29, 1986, 61-285202; Oct. 30, 1987, 62-275052
Int. Cl.[4] F02D *41/10*
U.S. Cl. 364—431.05 11 Claims

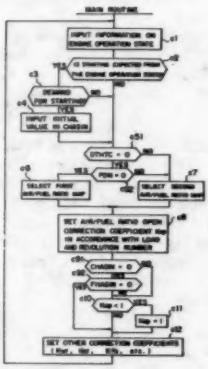
1. An air/fuel ratio controller for an engine, said controller being equipped with an engine operation zone discriminating means for discriminating a specific operation zone of the engine on the basis of at least one operation parameter of the engine and a lean air/fuel ratio setting means for setting the air/fuel ratio of an air-fuel mixture, which is to be fed to the engine, at a level leaner than a stoichiometric air/fuel ratio upon receipt of an engine operation zone discriminating means, which comprises:

an engine power control element;

a means for detecting an acceleration command, which is generated to drive the engine power control element in an engine power increasing direction, on the basis of one of a state of actuation of the engine power control element and a state of actuation of an input side of the engine power control element;

a means for detecting an actually accelerated state of the engine, which is established responsive to the acceleration command, on the basis of a change in the revolution number of the engine;

an air/fuel ratio enriching means operable preferentially to said lean air/fuel ratio setting means so as to set the air/fuel ratio of the air/fuel mixture, which is to be fed to the engine, at a level richer than the air/fuel ratio leaner than the stoichiometric air/fuel ratio; and



an air/fuel ratio enrichment control means for starting an operation of said air/fuel enriching means upon receipt of a signal from said acceleration command detecting means and for ending the operation of said air/fuel ratio enriching means upon receipt of another signal from said accelerated state detecting means;

whereby the air/fuel ratio of the air-fuel mixture to be fed to the engine is set at a level richer than the air/fuel ratio leaner than the stoichiometric air/fuel ratio by an operation of said air/fuel ratio enriching means from the time point of generation of the acceleration command until the end of an increase in the revolution number of the engine.

4,908,766

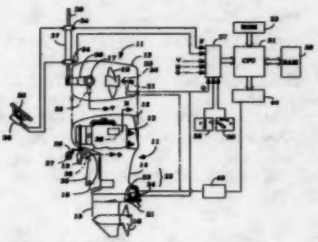
TRIM TAB ACTUATOR FOR MARINE PROPULSION DEVICE

Toshio Takeuchi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 27, 1987, Ser. No. 78,109
Claims priority, application Japan, Jul. 28, 1986, 61-175672
Int. Cl.[4] B63H *25/00*
U.S. Cl. 364—448 16 Claims

1. In a watercraft, steering means for effecting steering of said watercraft, a steering control operable by an operator for controlling the operation of said steering means, a trim tab movably supported by said watercraft from a neutral condition to any of a plurality of positions for creating a steering effect, means for actuating said trim tab between said positions, means for sensing a steering input to said steering control, means for sensing another watercraft condition, computer means for containing a plurality of premapped conditions for the positioning of said trim tab in response to sense steering input to said steering control and to said watercraft other condition for

achieving different steering effects by the position of said trim tab, operator control means for permitting an operator to select



the desired steering effect generated by said trim tab, and means for operating said means for activating said trim tab in response to an output signal from said computer means.

4,908,767

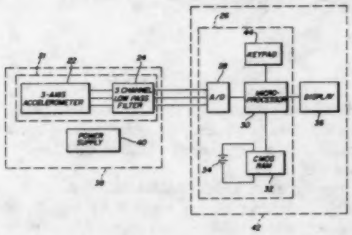
ACCELERATION MEASURING SYSTEM

Stephen R. Scholl, and Michael D. Valentine, both of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Filed Jan. 16, 1987, Ser. No. 4,123

Int. Cl.[4] G01P *15/00*

U.S. Cl. 364—453 **10 Claims**



1. A system for providing an indication of the acceleration experienced by a vehicle in the plane of the surface over which the vehicle moves, in which the system is mounted on the vehicle body and in which the suspension system of the vehicle permits the vehicle body to pitch and roll with respect to the surface when the vehicle is subjected to acceleration, comprising:

acceleration transducer means for providing indications of acceleration in nominal lateral, forward and vertical directions;

processor means, including:

leveling means, responsive to said indications from said acceleration transducer means, for providing indications of lateral and forward acceleration in a reference plane and of acceleration normal to the reference plane, with reference plane being fixed with respect to the body of the vehicle and horizontal when the vehicle is at rest on a horizontal surface, said leveling means performing the transformation:

[LEVEL] =

$$\begin{bmatrix} \cos\beta & -\sin\alpha\sin\beta & -\cos\alpha\sin\beta \\ 0 & \cos\alpha & -\sin\alpha \\ \sin\beta & \sin\alpha\cos\beta & \cos\alpha\cos\beta \end{bmatrix} \text{[TRANSDUCER]},$$

where is the acceleration vector with respect to the reference plane, is the acceleration vector in the nominal lateral, forward and vertical directions, α is the angle between the nominal forward direction and the reference plane, and β is the angle between the nominal lateral direction and the reference plane,

roll and pitch compensation means, responsive to said indications from the leveling means, for providing indications of lateral and forward acceleration in the plane of said surface, and

display means, responsive to said roll and pitch means, for displaying said indications of lateral and forward acceleration in the plane of said surface.

4,908,768

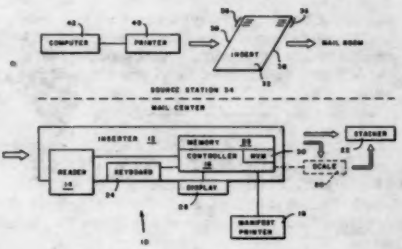
INSERTER BASED MAIL MANIFESTING SYSTEM

George G. Gelfer, West Redding, and William G. Hart, Jr., Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 7, 1987, Ser. No. 82,699

Int. Cl.[4] G07B *17/02*

U.S. Cl. 364—464.03 **14 Claims**



1. A system for processing a batch of mail, said system comprising:

an inserter, said inserter including a controller, said controller including means for storing rate information, said rate storing means being nonvolatile;

means for sensing information in the form of dash code from a document, said information including at least a zip code of the intended recipient of said document, said sensing means being in communication with said controller of said inserter;

means for changing said stored rate information; and

means for printing a manifest, said manifest printing means being controlled by said controller of said inserter such that a manifest can be printed based on some of said sensed information.

4,908,769

COMMODITY METERING SYSTEMS

John E. Vaughan, and Bernard Patry, both of Felixstowe, England, assignors to Schlumberger Electronics (UK) Limited, Franborough, United Kingdom

Filed Jun. 15, 1987, Ser. No. 61,373

Claims priority, application United Kingdom, Jun. 16, 1986, 8614620

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—464.04 **5 Claims**

1. A commodity metering system comprising:

a multi-rate meter including a timing circuit comprising a real-time electronic clock and a memory storing a plurality of real times, and a plurality of storage circuits for storing the respective amounts of successive time periods each commencing at a respective one of said stored real times;

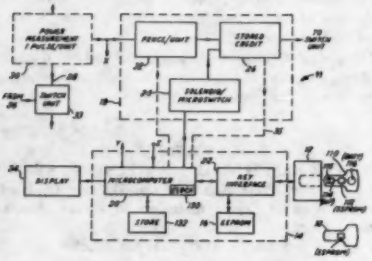
said system further comprising:

a key which contains a memory for storing a plurality of real

times, said key also contains a real-time electronic clock and a battery for maintaining the operation of said clock;

a receptacle in said meter for receiving said key; and

circuit means in said meter responsive to the insertion of said key into said receptacle to set each of the stored real times



in said meter memory to the respective real times stored in said key memory, said circuit means in said meter comprising means responsive to the insertion of said key into said receptacle to set said real-time clock in said meter to the real time to which said real-time clock in said key is set.

4,908,770

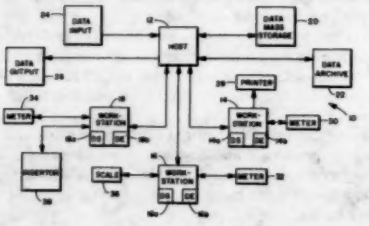
MAIL MANAGEMENT SYSTEM ACCOUNT VALIDATION AND FALLBACK OPERATION

Michelle S. Breault, Fairfield, and John H. Steinmetz, Bridgeport, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Jun. 30, 1987, Ser. No. 68,696

Int. Cl.[4] G07B *17/02*

U.S. Cl. 364—464.02 **14 Claims**



1. An accounting system comprising:

one or more operator workstations, each of said workstations having data entry means for entering and data memory means for storing accounting related data, the data being representative of at least an account identification code and a monetary value that is required to be charged to said account identification code;

a separate host device including data processing means;

means for connecting by way of a communications link said host device to each of said workstations;

each of said workstations including means for transmitting to said host device the accounting related data;

said host device including means operable upon receiving from one of said workstations the accounting related data for validating the received account identification code and also means for transmitting back to said one workstation a value dispensing enabling signal when the received accounting related data is valid;

a postage dispensing device connected to at least one of said workstations, said workstation including means to activate said postage dispensing device to dispense a monetary value of postage upon receipt by the workstation of said value dispensing enabling signal.

4,908,771

METHOD OF, AND APPARATUS FOR, PROCESSING DISTORTED PULSED SIGNALS

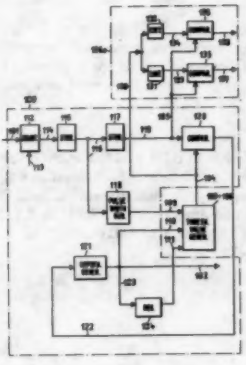
Julien Piot, Cambridge, Mass., assignor to Willi Studer AG, Regensdorf, Switzerland

Filed Jul. 6, 1987, Ser. No. 70,846

Claims priority, application Switzerland, Jul. 10, 1986, 02772/86

Int. Cl.[4] H03K *5/22, 9/08*; G01R *23/02*

U.S. Cl. 364—486 **10 Claims**



1. A method of processing a signal containing pulses which have been distorted by a preceding signal transfer operation on an original non-distorted pulsed signal, said method comprising the steps of:

measuring the pulse width of individual ones of the pulses;

presetting a predeterminate number of threshold values associated with predetermined values of the pulse width of the individual pulses;

classifying the measured pulse widths of the individual pulses in different classes defined by said predeterminate number of threshold values such that each one of said classes is associated with and indicative of an associated pulse width appearing in the original non-distorted pulsed signal; and

during said step of classifying said measured pulse widths, continuously comparing the measured pulse widths of the individual pulses and associated ones of said predeterminate number of threshold values and selectively varying either one of (i) said associated preset threshold values or (ii) the pulse widths of said individual pulses for improving the match between said measured pulse widths and said predeterminate number of threshold values.

4,908,772

INTEGRATED CIRCUITS WITH COMPONENT PLACEMENT BY RECTILINEAR PARTITIONING

Mely C. Chi, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Murray Hill, N.J.

Filed Mar. 30, 1987, Ser. No. 31,718

Int. Cl.[4] G06F *15/60, 15/20*

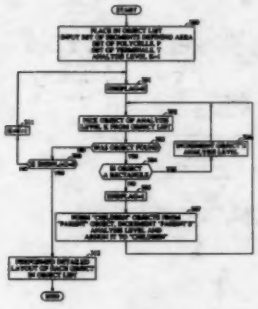
U.S. Cl. 364—491 **5 Claims**

1. An integrated circuit having a predetermined area for placing components (FIG. 3 101, 102) and further having input/output terminals (FIG. 3 104), macro cells situated in said area (FIG. 3 103), and a plurality of interconnected integrated circuit cells situated in said area and connected to said

macro cells and to said input/output terminals, where said integrated circuit is made in accordance with a process COMPRISING:

a step of situating said macro cells on said area without regard to edges of said area;

a step of iteratively, partitioning that portion of said area that is left after said situating of said macro cells, to develop a plurality of rectangular areas;



a step of assigning said input/output terminals to specific ones of said plurality of rectangular areas;

a step of allocating portions of said plurality of interconnected integrated circuit cells to each of said rectangular areas in proportion to the size of said rectangular areas, and accounting for said situating of said macro cells and said assigning of said input/output terminals; and

a step of situating allocated portions of said integrated circuit cells in said rectangular areas.

4,908,773

COMPUTER DESIGNED STABILIZED PROTEINS AND METHOD FOR PRODUCING SAME

Michael W. Pantoliano, Germantown, and Robert C. Ladner, Jamesville, both of Md., assignors to Genex Corporation, Gaithersburg, Md.

Filed Apr. 6, 1987, Ser. No. 34,964

Int. Cl.[4] G06F *15/46*; G01N *33/00*

U.S. Cl. 364—496 **28 Claims**

1. A computer based method for evaluating a protein to determine whether said protein contains at least two target amino acid residues, replacement of at least one of which with a cysteine residue would be sufficient to permit formation of at least one potentially protein stabilizing disulfide bond, said bond containing two cysteine residues; said method comprising the steps of:

(a) ascertaining relative three-dimensional positions of atoms of a pair of cysteine residues of a candidate disulfide bond;

(b)

(i) examining a candidate pair of amino acid residues of said protein to determine whether they contain atoms whose relative three-dimensional positions possess a geometric conformation which is similar to a geometric conformation possessed by atoms of said cysteine residues of said candidate disulfide bond (a);

(ii) examining whether replacement of the candidate pair of amino acid residues of said protein by said cysteine residues of said candidate disulfide bond can be accommodated, to thereby permit the formation of a potentially stabilizing disulfide bond, without creating a conformation of said protein molecule having unacceptable steric hindrance;

(c) repeating said examinations (b)(i) and (b)(ii) for each candidate pair of amino acid residues of said protein, and for each ascertained candidate disulfide bond (a);

(d) ranking each candidate pair of amino acid residues of said protein for its capacity to be replaced with a potentially stabilizing candidate disulfide bond, without undesirably altering said tertiary conformation of the protein molecule; and

(e) using said ranking (d) to identify a target pair of amino acid residues, replacement of at least one of which with a cysteine residue would be sufficient to permit formation of at least one potentially protein-stabilizing disulfide bond.

4,908,774

SYSTEM FOR ULTRASONIC EXAMINATION

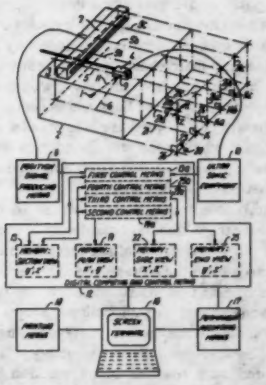
Svend A. Lund, Birkerod, and Willy D. Kristensen, Lyngby, both of Denmark, assignors to Akademiet for De Tekniske Videnskaber, Svejsecentralen, Denmark

PCT No. PCT/DK86/00048, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO87/07026, PCT Pub. Date Nov. 19, 1987

PCT Filed May 5, 1986, Ser. No. 138,034

Int. Cl.[4] G01N *29/06*; G01S *15/89*

U.S. Cl. 364—507 **4 Claims**



1. A system for producing and recording images of inhomogeneities in otherwise homogeneous objects having a plane or locally substantially plane surface, by ultrasonic examination according to the pulse-echo method, wherein

at least one ultrasonic probe can be moved over the surface of the object in steps of predetermined lengths along a rectilinear scanning path containing the projection on the surface of the central axis of the sound beam,

position signal producing means produces digital signals

containing information on the position on said surface of the successive points of incidence of the sound beam,

ultrasonic equipment makes said probe emit, on completion of each step of movement, at least one short pulse of ultrasonic energy into the object, and produces, on receipt of an echo pulse, digital signals containing information on the amplitude of said echo pulse, and on the length of the sound path from said point of incidence to the reflecting point causing the echo pulse,

digital computing means, including a first electronic matrix memory for data produced by the examination, said first matrix memory having storage addresses arranged in lines and columns associated with a similar, corresponding network of lines and columns of rectangular coordinates in the sectional plane through the object defined by the scanning path of the ultrasonic probe and the central axis of the sound beam, stores at each storage address data representing said echo amplitudes, and adds, on receipt of a new data item, said new data item to the sum of data items previously stored at said storage address,

first control means stores in said first matrix memory, upon receipt of said position signals and said echo pulse signals, data representing said echo amplitudes at all storage addresses located on a circle, having as its center the storage address associated with said point of incidence, and having as its radius the distance in said first matrix memory corresponding to said length of the sound path through the object,

a video screen terminal controls the scanning movement of said ultrasonic probe, controls the functioning of said ultrasonic equipment, said digital computing means, and said first control means, and displays sectional images derived from data stored in said first matrix memory,

recording means produces permanent, electronically readable records of data stored in said first matrix memory, and of sectional images displayed on said screen terminal,

printing means produces permanent prints of images displayed on said screen terminal,

said ultrasonic probe can be moved over the surface of the object along a number of successive, parallel rectilinear scanning paths at predetermined intervals,

said digital computing means further includes a second electronic matrix memory for data produced by the examination, said second matrix memory having storage addresses arranged in lines and columns associated with a similar, corresponding network of lines and columns of rectangular coordinates in a projection plane parallel to the surface of the object, where each storage address stores sums of data items representing said echo amplitudes, characterized in that:

said digital computing means further includes second control means which, on completion of each movement of said ultrasonic probe along the length of a scanning path, reads from the storage addresses arranged in each column of said first matrix memory the highest sum of data items stored in said column, stores said highest sums of data items at the corresponding storage addresses in said second matrix memory in the column associated with the line of intersection between said sectional plane and said projection plane, and resets all storage addresses in said first matrix memory at zero value;

said video screen terminal further controls the functioning of said second control means, and displays projection images derived from data stored in said second matrix memory; and

said recording means further produces permanent electronically readable records of data stored in said second matrix memory.

4,908,775

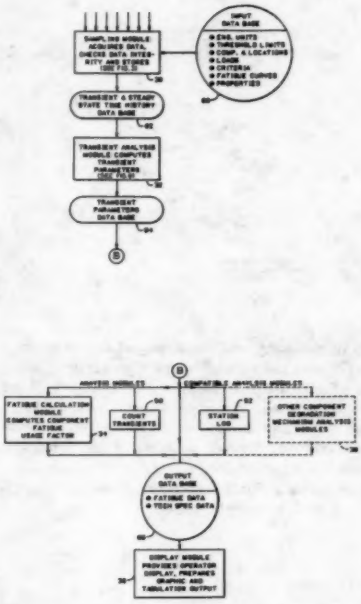
CYCLE MONITORING METHOD AND APPARATUS

Sam S. Palusamy, Murrysville; John C. Schmertz, Pittsburgh; Dali Li, Monroeville; John N. Chirigos, Churchill; Charles B. Bond, Plum Borough, and Chuang Y. Yang, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 24, 1987, Ser. No. 18,379

Int. Cl.[4] G21C *17/00*; G06F *15/74*

U.S. Cl. 364—508 **13 Claims**



1. A fatigue cycle monitoring method using a sensor for monitoring a mechanical component, said method comprising the steps of:

(a) sampling a sensor signal from the sensor and detecting a transient;

(b) producing a compressed transient from the sensor signal after the transient is detected in the sensor signal; and

(c) computing fatigue on the component from the compressed transient.

4,908,776

SPACECRAFT FUEL MEASUREMENT

Philip D. Crill, Los Altos, and Igor P. Leliakov, Sunnyvale, both of Calif., assignors to Ford Aerospace & Communications Corporation, Newport Beach, Calif.

Filed Nov. 23, 1987, Ser. No. 123,732

Int. Cl.[4] G01F *23/22*

U.S. Cl. 364—509 **7 Claims**

7. A method for determining the amount of liquid fuel remaining in a fuel tank on board a spacecraft, wherein an accelerometer having at least one axis has been mounted on board the spacecraft proximate the fuel tank, said method comprising the steps of:

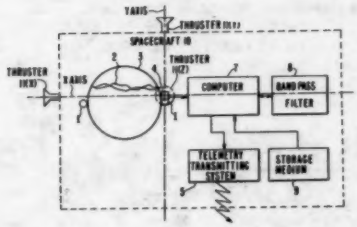
empirically generating on earth a set of retrievable data which converts frequency of oscillation of fuel sloshing within the tank to amount of fuel remaining within the tank;

after the spacecraft has been launched, imparting a force along an axis of the accelerometer;

in response to said force, obtaining from the accelerometer

an output signal proportional to the instantaneous acceleration along said axis;

converting said output signal into an oscillation frequency signal indicating the rate of change of the direction of the



instantaneous acceleration along said axis, said oscillation frequency signal being proportional to the frequency of oscillation of the sloshing fuel; and

applyig said oscillation frequency signal to a storage medium which contains said set of retrievable data.

4,908,777

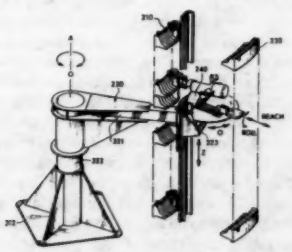
ROBOT ARM CALIBRATION SYSTEM

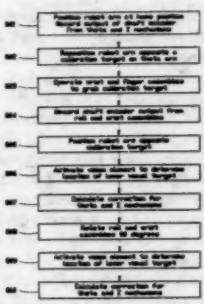
Samuel J. Wolfe, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Jan. 27, 1988, Ser. No. 148,617

Int. Cl.[4] G05B *19/42*

U.S. Cl. 364—513 **21 Claims**





1. In a robot arm system, where said robot arm includes an end effectuator with an associated vision system, a method of calibrating said robot arm comprising the steps of:

storing a sequence of independent calibration operations, with each sequential calibration operation having a greater positional accuracy than the preceding operation;

executing said stored sequence of calibration operations, wherein said stored sequence of calibration operations includes:

positioning said end effectuator opposite a two-dimensional vision calibration target;

activating said vision system to scan said two-dimensional vision calibration target;

repositioning said end effectuator based on the output of said vision system scan of said two-dimensional vision calibration target;

maintaining said vision system opposite said two-dimensional vision calibration target;

activating said vision system to rescan said two-dimensional vision calibration target; and

repositioning said end effectuator based on the output of said vision system rescan of said two-dimensional vision calibration target.

4,908,778

INDUCTIVE INFERENCE METHOD FOR OBTAINING RULES REPRESENTED BY PROPOSITIONAL LOGIC

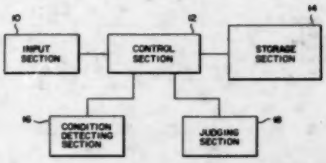
Takashi Moriyasu, and Hiroyuki Mizutani, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 890,552, Jul. 30, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 250,995

Claims priority, application Japan, Aug. 2, 1985, 60-170762

Int. Cl.[4] G06F *15/18*

U.S. Cl. 364—513 **4 Claims**



1. An inductive inference method for obtaining necessary and sufficient conditions represented by propositional logic in a computerized expert system by inducing expert knowledge necessary for knowledge information processing, comprising the steps of:

(1) reading into the computer an initial necessary condition and an initial sufficient condition stored in a memory of said expert system;

(2) reading example data from said memory, said example data having proposition, conditions of said proposition and tendency of each condition, said proposition and conditions having truth or falsity, said tendency having a first tendency (I), a second (II) or a third (III), said first tendency positively supporting the truth of the proposition, said second tendency positively supporting the falsity of the proposition, and said third tendency not positively supporting the truth or falsity of the proposition;

(3) obtaining a necessary condition and a sufficient condition based on the following result such that when the proposition is false, said necessary condition is obtained by logically ORing said initial necessary condition and said condition having the falsity and said tendency (I), by logically ORing said initial necessary condition and a logically negated condition of said condition having the truth and said tendency (II), by logically ORing said initial necessary condition and said condition having the falsity and said tendency (III), and by logically ORing said initial necessary condition and a logically negated condition of said condition having the truth and said tendency (III), and when the proposition is true, said sufficient condition

is obtained by logically ANDing said initial sufficient condition and said condition having the truth and said tendency (I), by logically ANDing said initial sufficient condition and a logically negated condition of said condition and a logically negated condition of said condition having the falsity and said tendency (I), by logically ANDing said initial sufficient condition and said condition having the truth and said tendency (III), and by logically ANDing said initial sufficient condition and a logically negated condition of said condition having the falsity and said tendency (III); and

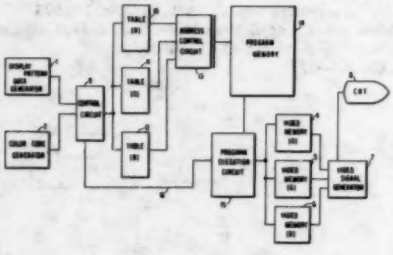
(4) repeating said steps (2) and (3) for another example data to obtain updated necessary condition and sufficient condition, by using said necessary condition and said sufficient condition as said initial necessary condition and said initial sufficient condition, respectively, in step (3).

4,908,779

DISPLAY PATTERN PROCESSING APPARATUS

Tsukasa Iwata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 2, 1986, Ser. No. 847,343
Claims priority, application Japan, Apr. 2, 1985, 60-69301
Int. Cl.[4] G06F *3/153*
U.S. Cl. 364—518 **6 Claims**



1. A display pattern processing apparatus comprising:

means for generating a display pattern;

means for generating a plurality of color codes, including red component codes, green component codes, and blue component codes, for displaying the display pattern in a plurality of colors;

a program memory for storing a first program for producing a first constant value irrespective of the display pattern, a second program for producing a second constant value irrespective of the display pattern, said second constant value being different from said first constant value, and a third program for producing a third value relative to the display pattern;

means, responsive to said red component codes and to said display pattern generating means, for selecting one of said first to third programs and for executing the selected program to produce red color component data accordingly;

means, responsive to said green component codes and to said display pattern generating means, for selecting one of said first to third programs and for executing the selected program to produce green color component data accordingly;

means, responsive to said blue component codes and to said display pattern generating means, for selecting one of said first to third programs and for executing the selected program to produce blue color component data accordingly;

a plurality of video memories for receiving said red, green, and blue color component data; and

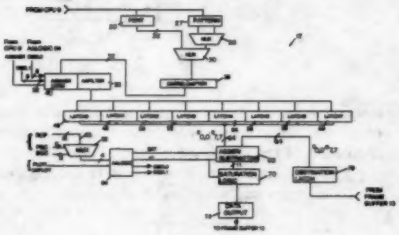
means for writing said red, green, and blue color component data into said video memories.

4,908,780

ANTI-ALIASING RASTER OPERATIONS UTILIZING SUB-PIXEL CROSSING INFORMATION TO CONTROL PIXEL SHADING

Curtis Priem, Freemont, Calif.; Thomas Webber, Lynn, Mass., and Chris Malachowsky, Santa Clara, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 14, 1988, Ser. No. 258,133
Int. Cl.[4] G06F *15/62*; G09G *1/16*
U.S. Cl. 364—521 **15 Claims**



1. An apparatus including a central processing unit for generating control signals including background color control signals and foreground color control signals, said apparatus for performing Boolean raster operations on source and destination data for storage in a frame buffer memory for a plurality of planes, said source data being selected from one of a font register and a pattern register, said destination data being selected from said frame buffer, wherein said destination data stored in said frame buffer is organized as pixels of information to be displayed, and each of said pixels is logically divided into a plurality of sub-pixels, said apparatus comprising:

(a) source data select means coupled to said font register and said pattern register for selecting source data;

(b) anti-aliasing mask logic coupled to said source data select means and said central processing unit for generating for each of said pixels to be displayed a fraction between 0 and 1 representing the ratio of the number of sub-pixels crossed by an image segment going through the pixel to the total number of sub-pixels within the pixel to the total number of sub-pixels with the pixel corresponding to said sub-pixels;

(c) filter means coupled to said mask logic means for encoding the output generated by said mask logic means, said encoded output corresponding to one of a plurality of shades of gray for each of said pixels to be displayed;

(d) multiplexer means coupled to said central processing unit and said anti-aliasing mask logic means for selecting a Boolean raster operation to be performed for each of said plurality of planes using said foreground color control signals and said background color control signals;

(e) logic means coupled to said multiplexer means and said central processing unit for generating SSEL0 and SSEL1 control signals used by said anti-aliasing mask logic means, a saturation control signal and a +/− control signal;

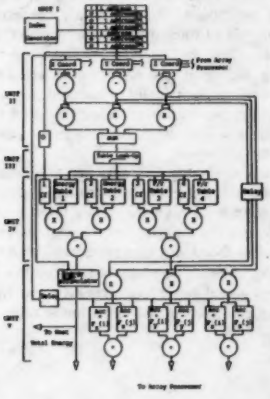
(f) adder/subracter means coupled to said source data select menas, said frame buffer and said logic means for adding and subtracting the sub-pixel values for each row of sub-pixel information in each pixel;

(g) saturation logic means coupled to said adder/subtracter means for saturating the values output by said adder/subtracter means to values between 0 and 128.

4,908,781
COMPUTING DEVICE FOR CALCULATING ENERGY AND PAIRWISE CENTRAL FORCES OF PARTICLE INTERACTIONS

Cyrus Levinthal, and Richard M. Fine, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Nov. 12, 1985, Ser. No. 796,870
Int. Cl.[4] G06F *15/52*
U.S. Cl. 364—524 12 Claims



1. A computing device which calculates the total energy and total pairwise, central forces between selected pairs of discrete, interacting particles within a system which comprises

a. means for generating as digital outputs both (i) a retrievable identifier of the spatial coordinates (x, y, z) for all selected pairs of particles i and j which interact with one another within the system and (ii) retrievable identifiers of the type of pairs, cental interaction between each ij pair;

b. means for (i) inputting digital outputs from the generating means, (ii) determining therefrom r^2, the square of the radius vector between each i and j, by calculating solutions for the equation

$$r^2 (x_i-x_j)^2+(y_i-y_j)^2+(z_i-z_j)^2,$$

where (x_i, y_i, z_i) and (x_j, y_j, z_j) are the spatial coordinates for i and j obtained as digital inputs from the generating means, and (iii) outputting r^2 values in digital word form;

c. look-up means for (i) inputting r^2 values in digital word form, (ii) determining therefrom [r, the square root of r^2] respective values correspoding to a predetermined function of r^2, and (iii) outputting [r] said respective values in digital word form;

d. means for (i) inputting the digital outputs of the generating means relating to the types of pairwise, central interactions and for inputting the [r] values from the [r determining] look-up means, (ii) calculating therefrom the energy and the force/r values for each ij pair of particles, and (iii) outputting the energy and force/r values for each ij pair of particles in digital word form;

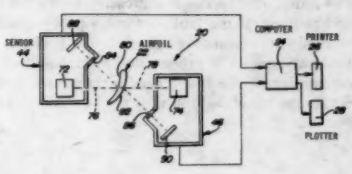
e. means for (i) inputting the force/r values from the force/r calculating means, (ii) determining therefrom the Cartesian components of the force on each particle i within each pair ij, and (iii) outputting the cartesian component values of the force between each particle pair ij in digital output form; and

f. means for (i) inputting for each particle pair ij the energy values from the energy calculating means and the Cartesian component values of the force from the means for determining the total pairwise, central force values between each ij particle pair, (ii) accumulating the total energy values for each ij particle pair and the total force values between each particle pair ij, and (iii) outputting such total energy and total force values.

4,908,782
AIRFOIL INSPECTION METHOD

Herbert C. Pekarek, Gates Mills, and Richard D. Pryatel, Seven Hills, both of Ohio, assignors to Compressor Components Textron Inc., Cleveland, Ohio

Filed May 19, 1983, Ser. No. 495,961
Int. Cl.[4] G01B *11/24, 21/20*
U.S. Cl. 364—560 17 Claims

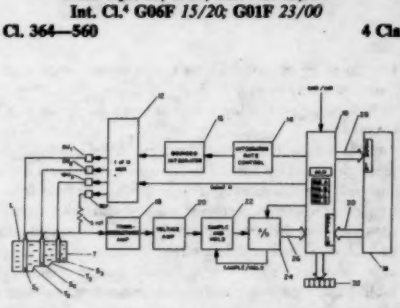


1. A method of determining how closely the cross sectional configuration of an airfoil corresponds to a reference cross sectional configuration, said method comprising the steps of measuring the airfoil in a plane extending transversely to a central axis of the airfoil, determining data representative of the mean camber line of the measured airfoil, establishing an initial relationship between the data representative of the measured airfoil mean camber line with data representative of a mean camber line for a reference airfoil, changing the relationship between the data representative of the measured airfoil mean camber line and the data representative of the reference airfoil mean camber line from the initial relationship to each of a plurality of different relationships, and determining at which of the relationships between the data representative of the measured airfoil mean camber line and the data representative of the reference airfoil mean camber line there is a best fit condition in which surfaces of the airfoils overlie each other to the maximum extent possible.

4,908,783
APPARATUS AND METHOD FOR DETERMINING LIQUID LEVELS

Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Filed Apr. 28, 1987, Ser. No. 43,500
Int. Cl.[4] G06F *15/20*; G01F *23/00*
U.S. Cl. 364—560 4 Claims



1. An apparatus for determining the quantity of a liquid in a liquid-containing tank, the tank having at least first and second attitudes relative to the gravity vector, comprising:

at least N liquid-level sensing probes in a liquid-containing tank, each probe having a first and at least a second probe-

specific liquid-quantity profile for a first and at least a second attitude of the probe relative to the gravity vector;

means for determining a value representative of the fraction of each of said N probes immersed in the liquid;

memory means containing N and N' sets of M sequential storage locations containing liquid-quantity profile information for respective ones of said N liquid-level sensors for their respective first and second attitudes; and

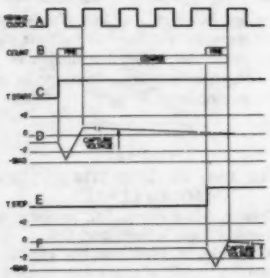
addressing means for addressing said memory means to determine liquid-quantity information for each of said N liquid-level sensing probes, said addressing means addressing said memory means at a specific probe-quantity address, said probe-quantity address being defined as a function of a first address offset representative of the first or second attitude of the tank, a second probe-specific address offset representative of a relative position of the probe in a series of N probes, and a third address offset representative of the fraction of a respective probe immersed in the liquid multiplied by the M sequential storage locations.

4,908,784

METHOD AND APPARATUS FOR ASYNCHRONOUS TIME MEASUREMENT

Gary W. Box, Golden Valley; Thomas S. Foote-Lennox, Bloomington; Rodney G. Herreid, St. Louis Park; James F. Hoff, Shoreview; Dennis J. Leisz, Minnetonka; John A. Perlick, Brooklyn Park; Terry T. Steeden, Richfield; John J. Turner, New Brighton, and Curtis R. Alexander, Forest Lake, all of Minn., assignors to Wave Technologies, Inc., Plymouth, Minn.

Filed Aug. 4, 1987, Ser. No. 81,368
Int. Cl.[4] G04F *8/00*; G06F *15/20*
U.S. Cl. 364—569 **25 Claims**



1. Improved asynchronous time measurement apparatus, the improvement comprising:

(a) a first clock producing a repetitive clock signal at a first frequency;

(b) means connected to said first clock for counting complete clock cycles from a first event to a second event;

(c) means for accumulating charge during the time from the first event to a predetermined edge of said clock signal and the time from the second event to a predetermined edge of said clock signal and separately comparing the accumulated charges relative to a linear charge characteristic table generated using calibration measurement events of random duration and random separation from one another, the table being stored in a memory, to determine corresponding times therefor; and

(d) means for arithmetically processing the determined times corresponds to the first, second and complete clock cycle intervals to determine the magnitude of the elapsed time between the first event and the second event.

4,908,785

DATA COMPRESSION METHOD FOR TELEMETRY OF VIBRATION DATA

Thomas D. Cubbins, Seattle; Thomas R. Hope, Woodinville, and John M. Michels, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 16, 1985, Ser. No. 766,738
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—576 **19 Claims**

1. A method for compressing vibration data for telemetry from a missile or spacecraft while allowing complete assessment of important vibration modes, comprising the steps of:

(a) sensing the missile vibration at a predetermined sample rate with at least one strain gauge to generate raw vibration data;

(b) splitting the signal into a first and a second signal path, the paths being electrically connected in parallel;

(c) filtering the raw vibration data in the first signal path to obtain an uncompressed low frequency component suitable for transmission;

(d) frequency analyzing the data in the second signal path into compressed frequency/amplitude data suitable to identify sources of high frequency vibrations; and

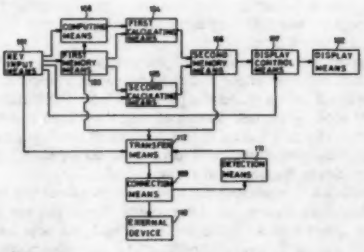
(e) multiplexing the compressed frequency/ amplitude data with the low frequency component without further signal processing of either component to provide a mixed signal, the mixed signal being compressed from the raw signal and being suitable for efficient transmission.

4,908,786

ELECTRONIC CALCULATOR HAVING GRAPH DISPLAYING FUNCTION

Michiaki Kuno, Yamatokoriyama; Noboru Akizuki, Nara, and Taizo Nishida, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Jausga, Osaka, Japan

Filed Oct. 16, 1987, Ser. No. 109,280
Claims priority, application Japan, Oct. 17, 1986, 61-247866; Oct. 21, 1986, 61-250072; Oct. 21, 1986, 61-250073
Int. Cl.[4] G06F *15/02*
U.S. Cl. 364—710.11 **7 Claims**



1. An electronic calculator having a graph displaying function, comprising:

key input means for entering numerical values and a functional equation;

display means having a plurality of display dots in a uniform

distribution over a predetermined area of a display screen for displaying a graph of said functional equation in a two-dimensional coordinate system;

first memory means for storing said functional equation entered by said key input means;

first calculating means for calculating a coordinate range of said functional equation specified by said numerical values from said key input means on said two-dimensional coordinate system;

second calculating means for calculating a specified range for said functional equation in response to a tracing instruction being given by said key input means;

second memory means for storing said coordinate range and said specified range obtained by said first and second calculating means; and

display control means for displaying said graph of said functional equation corresponding to said coordinate range of said first calculating means over the entire display screen of said display means, and for subsequently scrolling said display screen along a trace of said graph in response to said tracing instruction and displaying said specified range of said second calculating means for said graph.

4,908,787

INTERPOLATOR/DECIMATOR FILTER STRUCTURE AND A NOTCH FILTER THEREFOR

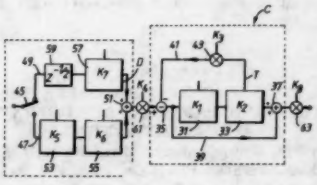
Nigel P. Dyer, London, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 8, 1986, Ser. No. 894,994

Claims priority, application United Kingdom, Aug. 28, 1985, 8521377

Int. Cl.[4] G06F *15/31;* H03H *17/04*

U.S. Cl. 364—724.10 7 Claims



1. A filter structure, operable between a lower and a higher sampling rate comprising:

a switched branched network, having at least two branches including one or more all-pass-network filters, said switched branched network connected in series with a notch filter having a transmission zero at a frequency displaced from a frequency of one half of the lower sampling rate, said notch filter being comprised of a plurality of all-pass-network filters;

each all-pass-network filter including a delay element and at least one coefficient multiplier and having as a characteristic a transform function X(Z) of the form:

$$X(Z)=(Z^{-1}-K)\,/\,(1-KZ^{-1})$$

where Z^{1} is the unit delay operator and K is the multiplier coefficient.

4,908,788

SHIFT CONTROL SIGNAL GENERATION CIRCUIT FOR FLOATING-POINT ARITHMETIC OPERATION

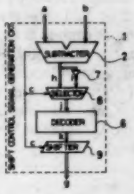
Toshiki Fujiyama, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 9, 1987, Ser. No. 71,739

Claims priority, application Japan, Oct. 9, 1986, 61-241682

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—748 6 Claims



1. A shift control signal generation circuit for floating-point arithmetic operation, which comprises:

a subtracter for receiving first and second exponent data and providing a subtraction result and a carry signal;

an inverter connected to said subtracter r for inverting said subtraction result to provide an inversion data;

a selector responsive directly to said carry signal to select between said subtraction result and said inversion data;

a decoder connected to said selector for decoding an output from said selector to provide a decoded data; and

a shifter responsive directly to said carry signal to either transfer said decoded data as it is or shift said decoded data to provide a shift control signal.

4,908,789

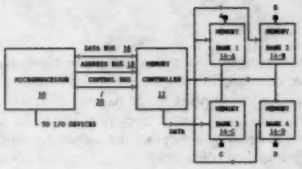
METHOD AND SYSTEM FOR AUTOMATICALLY ASSIGNING MEMORY MODULES OF DIFFERENT PREDETERMINED CAPACITIES TO CONTIGUOUS SEGMENTS OF A LINEAR ADDRESS RANGE

Dag R. Blokkum; Charles R. Johns, both of Austin; Lee J. Morozink, Round Rock, and David L. Peterson, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1987, Ser. No. 34,236

Int. Cl.[4] G06F *12/00, 12/02, 12/06*

U.S. Cl. 364—900 11 Claims



1. A memory sub-system for an information handling system for automatically creating a linear address range from a plurality of memory arrays installed in a plurality of simultaneously addressable memory banks, regardless of the number and type of said installed arrays, where each different said type of installed array has a different maximum number of addressable storage locations where each said maximum number is an even multiple of the smallest said maximum number, said range comprising a plurality of contiguous segments each of which comprises the same predetermined number of addressable locations, the maximum permissible number of said contiguous segments in said linear address range being a function of the

number of said banks and the ratio of address capacities of the arrays having the largest and smallest capacity, said information handling system having a data bus comprising a pre-established number D of data lines and a memory address bus having a total number (H+L) of address lines for addressing said address range, said sub-system comprising,

a plurality of said memory banks each of which is addressed simultaneously by a number L of low order memory bus address lines, said number L being determined by the array type having the largest said maximum number of said addressable storage locations of any said array types that are supported by said sub-system,

means for developing at each said bank, size signals to indicate the type of array that is installed in said bank,

means for generating from selected high order address bus lines a plurality of segment identifying signals corresponding in number to at least said maximum permissible number of said contiguous segments, and

logic means including a plurality of interrelated logic cells each of which includes a plurality of logic elements interrelated in a predetermined combinatorial circuit for assigning said addressable locations of the array installed in each said bank to contiguous said segments of said linear range in response to said segment identifying signals supplied to said logic cells and in accordance with said array size signals for said installed arrays.

4,908,790

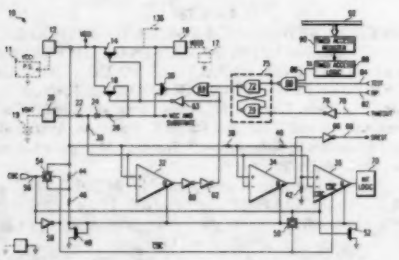
BACKUP BATTERY SWITCHING CIRCUITRY FOR A MICROCOMPUTER OR A MICROPROCESSOR

Wendell L. Little, Carrollton, and Stephen N. Grider, Farmers Branch, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Mar. 10, 1988, Ser. No. 166,383

Int. Cl.[4] G06F *1/00*; G11C *7/00*

U.S. Cl. 364—900 **4 Claims**



1. In a microcomputer or microprocessor having a first input terminal for coupling to a primary power source, a second input terminal for coupling to a backup battery, an output terminal for providing power supply voltage to an external circuit, and a comparison means for comparing voltage at said first input terminal to the voltage at said second input terminal, the improvement comprising:

(a) a latch circuit having an output terminal which switches to a first logic state when said microcomputer or microprocessor has issued a sequence of predetermined commands, and switches to a second logic state when a counter in said microcomputer or microprocessor counts a predetermined number of clock cycles of said microcomputer or microprocessor after said counter has been reset; and

(b) switching means for operatively connecting said backup battery voltage to said output terminal when said voltage at said first input terminal is less than the voltage at said second input terminal and said output of said latch circuit is in said first logic state, and for isolating said second input terminal from said output terminal when said voltage at said first input terminal is greater than said voltage at said second input terminal or said output of said latch circuit is in said second logic state.

4,908,791

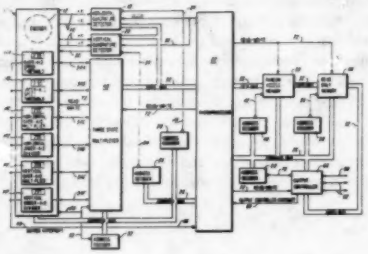
SWITCH DISPLAY ENCODER APPARATUS

Paul J. Giorgio, 285 River Ave., Providence, R.I. 02908

Filed Jan. 15, 1988, Ser. No. 146,743

Int. Cl.[4] G06F *3/033*

U.S. Cl. 364—900 **16 Claims**



1. A switch display encoder apparatus for use with a sensing system, said sensing system detects and processes the operation of said switch display encoder apparatus, said switch display encoder apparatus comprising:

encoding means for determining positional data, said encoding means also for generating and transmitting signals to said sensing system indicative of said positional data;

switching means for selecting modifications to said positional data, said switching means including position adjustment selectors and speed threshold parameter selectors, said switching means also for generating and transmitting signals to said sensing system indicative of the settings of said position adjustment selectors and said speed threshold parameter selectors; and

numeric displaying means for displaying the settings of said position adjustment selectors and speed threshold parameter selectors.

4,908,792

CONTROL SYSTEM TO CONTROL OPERATION OF AN APPARATUS, MORE PARTICULARLY OPERATION OF AN AUTOMOTIVE VEHICLE

Bernd Przybyla, Schwieberdingen; Alfred Bruckelt, Steinheim, and Michael Kirschner, Pforzheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 698,318, Feb. 5, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 87,995

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419559

Int. Cl.[4] G06F *15/20, 13/00*

U.S. Cl. 364—900 **10 Claims**

1. A vehicular microcomputer system, to control operation of an internal combustion engine and additional vehicular apparatus, having

a central processing unit (30);

an interface (20);

means (10) to apply apparatus operating data to the interface (20);

read-only memory (40);

a buffer random-access (RAM) memory (50);

an interconnection bus (80) interconnecting the central processing unit (30), the interface (20), the read-only memory (40) and the buffer memory (RAM) (50);

an auxiliary read-only memory (41) selectively connectable to said interconnection bus (80);

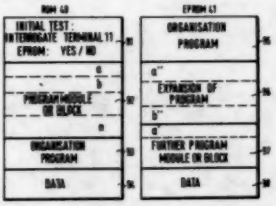
and means (11) coupled to the central processing unit (30) to recognize whether or not the auxiliary read-only memory (41) is connected to the bus (80),

and comprising, in accordance with the invention,

means for controlling the operation of the program of the central processing unit (30) including

program data (91–94) stored in modular or block form in the read-only memory (40) and auxiliary program data (95–98) stored in modular or block form in the auxiliary read-out memory (41);

the program data stored in the read-only memory (40) including



a basic organization program (93),

a program step (91) for recognition of the presence of the auxiliary read-only memory (41); and

a conditional instruction that, whenever the presence of the auxiliary read-only memory (41) is recognized, the central processing unit (30) is to execute selected instructions or program steps (92, 96,97) from the read-only memory (40) and the auxiliary read-only memory (41) according to a program sequence (95), in the auxiliary memory (41), alternative to, and to the extent necessary, inverted with respect to, the sequence in said basic organization program (93).

4,908,793

STORAGE APPARATUS INCLUDING A SEMICONDUCTOR MEMORY AND A DISK DRIVE

Hirotsugu Yamagata; Takafumi Oka; Masafumi Nozawa, all of Odawara, and Shinichi Kawada, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,844

Claims priority, application Japan, Oct. 17, 1986, 61-245239

Int. Cl.[4] G11C *5/02;* **G11B** *5/012, 33/02*

U.S. Cl. 365—52 **3 Claims**

1. A storage apparatus comprising:

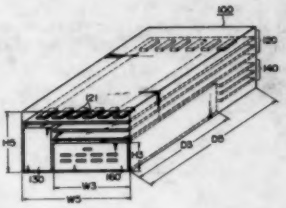
a housing having the approximate dimensions of 82.5 mm in height, 146 mm in width, and 203 mm in length;

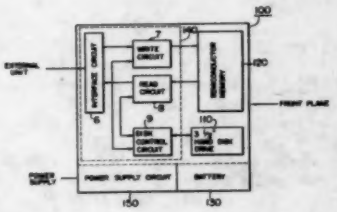
a ¼ inch disk drive accommodated in said housing;

a semiconductor memory accommodated in said housing and connected to said disk drive;

a control circuit to control said disk drive and semiconductor memory accommodated in said housing; and

a battery accommodated in said housing for supplying power to said storage apparatus after a power supply of said storage apparatus has been shut off or fails, so as to provide uninterrupted supply of power to said storage





apparatus and enable data stored in said semiconductor memory to be transferred to a disk in said disk drive.

4,908,794

SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED OUTPUT CIRCUIT

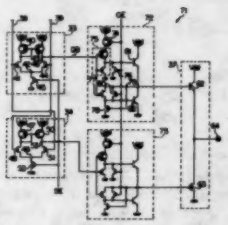
Takashi Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,986

Claims priority, application Japan, Nov. 16, 1987, 62-289915

Int. Cl.[4] G11C *11/40, 7/00*

U.S. Cl. 365—189.08 **5 Claims**



1. A semiconductor memory device having a plurality of memory cells arranged in rows and columns, a data bit read out from one of said memory cells being supplied to a pair of data lines, comprising:

(a) a first sense amplifier circuit coupled to said data lines and operative to increase a difference in voltage level between said data lines for producing a data bit signal;

(b) a first NOR gate activated by an output enable signal and coupled at an input node thereof to said first sense amplifier circuit for producing an inverted signal of said data bit signal;

(c) a second sense amplifier circuit coupled to said data lines and operative to increase the difference in voltage level on said data lines for producing the inverse of said data bit signal;

(d) a second NOR gate activated by said output enable signal and coupled at an input node thereof to said second sense amplifier circuit for producing a non-inverted signal of said data bit signal; and

(e) an output inverter circuit responsive to said inverted signal and said non-inverted signal for producing an output data signal.

4,908,795

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH BUILT-IN MEMORIES

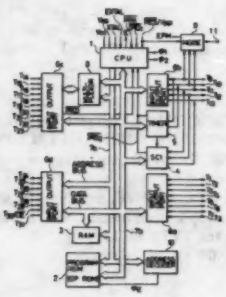
Fumio Tsuchiya, and Kiyoshi Matsubara, both of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 802,198, Nov. 25, 1985. This application Oct. 11, 1988, Ser. No. 255,252

Claims priority, application Japan, Nov. 26, 1984, 59-248106; Nov. 26, 1984, 59-248108

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—189.01 36 Claims



1. A semiconductor integrated circuit device comprising:

an information processing circuit which is operated by a periodic timing signal;

an electrically programmable read only memory which is coupled to said information processing circuit and which is accessed by either said information processing circuit to read out data stored therein or from outside of said semiconductor integrated circuit device to write data therein, wherein said electrically programmable read only memory has a memory array and a peripheral circuit and wherein said peripheral circuit is statically or dynamically operated to access said memory array when said electrically programmable read only memory is accessed by either said information processing circuit or from the outside of said semiconductor integrated circuit device; and

a control circuit for setting an operation of said peripheral circuit of said electrically programmable read only memory so that said peripheral circuit is statically operated when said electrically programmable read only memory is accessed from the outside of said semiconductor integrated circuit device and said peripheral circuit is dynamically operated in response to said periodic timing signal when said electrically programmable read only memory is accessed by said information processing circuit.

4,908,796

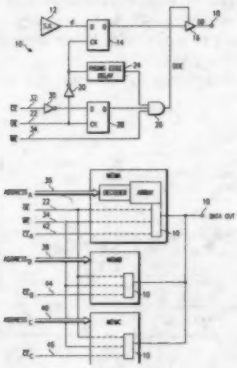
REGISTERED OUTPUTS FOR A MEMORY DEVICE

Robert D. Lee, Denton; Hal Kurkowski, and Michael L. Bolan, both of Dallas, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed May 24, 1988, Ser. No. 198,164

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.05 11 Claims



1. A method for providing data at an output terminal of a memory device comprising the steps of:

(a) storing, in a storage device, the output signal of a sense amplifier in said memory device upon a first transition of an output enable signal applied to said memory device;

(b) receiving a chip enable signal provided externally to said memory device upon a second transition, opposite to said first transition of said output enable signal, and placing a first logic level on an internal node of said memory device if said chip enable signal is within a predetermined voltage range; and

(c) enabling an output driver circuit, coupled to said storage device, to drive said output terminal of said memory device in response to data stored in said storage device if said internal node is at said first logic level.

4,908,797

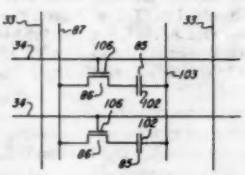
DYNAMIC MEMORY ARRAY WITH QUASI-FOLDED BIT LINES

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 110,304, Oct. 20, 1987, abandoned, which is a continuation of Ser. No. 634,899, Jul. 26, 1984, Pat. No. 4,701,885. This application Dec. 21, 1988, Ser. No. 289,415

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—207 21 Claims



1. A semiconductor memory device comprising:

an array of rows and columns of memory cells, each column comprising a plurality of segments having separate groups of said memory cells coupled thereto, each segment being

separately coupled to one of a pair of bit lines and each memory cell in a row being connected to a row control line;

a plurality of sense amplifiers, each sense amplifier having a separate input coupled to one end of each of said pair of bit lines in each of said columns, each of said pair of bit lines being physically placed on the same side of its corresponding sense amplifier; and

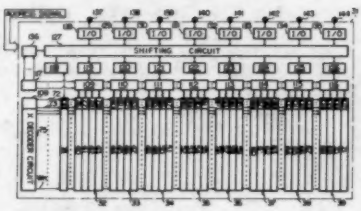
a plurality of segment select lines, each select line separately selecting at least two of said segments along each of said columns.

4,908,798

SEMICONDUCTOR MEMORY DEVICE WITH MEMORY CELL ARRAYS AND A REDUNDANT MEMORY CELL ARRAY ASSOCIATED WITH A SMALL NUMBER OF WRITE-IN AND SENSE AMPLIFYING CIRCUITS

Takahiko Urai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,969
Claims priority, application Japan, Jul. 20, 1987, 62-181612
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—230.03 7 Claims



1. A semiconductor memory device fabricated on a single semiconductor chip, comprising:

(a) a plurality of major memory cell blocks each divided into a plurality of major memory cell sub-blocks, each of said major memory cell sub-blocks having a plurality of major memory cells arranged in rows and columns;

(b) a redundant memory cell block having a plurality of redundant memory cells arranged in rows and columns, said redundant memory cells being equal in number to said major memory cells of each major memory cell sub-block;

(c) a plurality of word lines each coupled to said major memory cells in each row of each major memory cell sub-block, each of said word lines being further coupled to said redundant memory cells in each row of said redundant memory cell block;

(d) a row decoder circuit responsive to a row address signal and operative to activate one of said word lines;

(e) a plurality of first bit line pairs each coupled to said major memory cells in each column of each major memory cell sub-block, data bits stored in said major memory cells respectively appearing on said first bit line pairs upon activation of said word line;

(f) a plurality of second bit line pairs each coupled to said redundant memory cells in each column of said redundant memory cell block, data bits stored in said redundant memory cells respectively appearing on said second bit line pairs upon activation of said word line;

(g) a first column decoder circuit responsive to a column address signal and producing a first control signal;

(h) a plurality of first column selectors each provided in association with one of said major memory cell sub-blocks and said redundant memory cell block, each of said first column selectors being responsive to said first control signal and operative to select one data bit from said data bits appearing on said first bit line pairs for each major memory cell sub-block or appearing on said second bit line pairs for said redundant memory cell block;

(i) a second column decoder circuit responsive to said column address signal and producing a second control signal and an information signal;

(j) a plurality of second column selectors each provided in association with each of said major memory cell blocks, each responsive to said second control signal and operative to transmit one of data bits supplied from said first column selectors provided in association with each major memory cell sub-block;

(k) a plurality of combined circuits for write-in and sense amplifying operations coupled to said second column selectors and said first selector provided in association with said redundant memory cell block, respectively;

(l) a redundant information storage capable of storing memory locations of said major memory cells detected as defective major memory cells, said redundant information storage being responsive to said information signal and operative to produce a third control signal; and

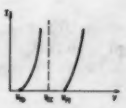
(m) a shifting circuit responsive to said third control signal and operative to replace the data bit supplied from one of said defective major memory cells with the data bit supplied from said redundant memory cell, respectively.

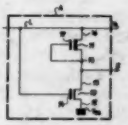
4,908,799

DEVICE TO DETECT THE FUNCTIONING OF THE READ SYSTEM OF AN EPROM OR EEPROM MEMORY CELL

Yann Gaudronneau, Aubane, France, assignor to Thomson Composants Militaires Et Spatiaux, Paris, France

Continuation of Ser. No. 64,019, Jun. 19, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,538
Claims priority, application France, Jun. 24, 1986, 86 09103
Int. Cl.[4] G11C *29/00, 7/00*
U.S. Cl. 365—241 7 Claims





1. An integrated circuit comprising:

a memory circuit having electrically programmable read-only memory cells, each of said cells comprising a transistor having a first or second threshold voltage VT0 or VT1, depending upon whether the cell is programmed or not, said cells being readable upon application of a normal reading supply voltage Vcc between VT0 and VT1 during a read operation;

inhibiting means for preventing operation of the memory cells if a voltage higher than a predetermined level is applied as a reading voltage during a read operation, said predetermined level being between Vcc and the higher of VT0 and VT1,

wherein said inhibiting means comprises,

detection means for providing a detection signal in case a voltage higher than said predetermined level is applied as a reading voltage, and

logical means connected to an output of said detection means and having an output for supplying an inhibiting

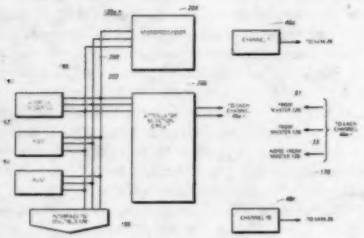
signal within the integrated circuit upon reception of the detection signal.

4,908,800

MULTI-CHANNEL ACOUSTIC SIMULATOR

Marc C. DiLemmo, Warminster, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1989, Ser. No. 367,814
Int. Cl.[4] H04B *17/00*
U.S. Cl. 367—13 **20 Claims**



1. A method for generating phase related acoustic data in a system to simulate the output of a plurality of hydrophones of a hydrophone array representative of an ocean bottom for testing a receiver of a sonar sounding system having a channel corresponding to each hydrophone and a master frequency signal, comprising the steps of:

providing analog signals representative of the output of at least two hydrophones of the hydrophone array;

periodically determining a phase angle for each of the analog signals to provide periodic phase shift data for each analog signal;

phase shifting the master frequency signal in accordance with the phase shift data; and,

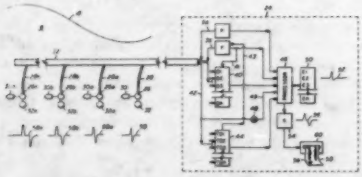
applying the phase shifted analog signals to respective channels of the receiver.

4,908,801

REAL-TIME SIMULATION OF THE FAR-FIELD SIGNATURE OF A SEISMIC SOUND SOURCE ARRAY

Robert R. Bell, and Stephen M. Whitley, both of Houston, Tex., assignors to Teledyne Exploration, Houston, Tex.

Filed May 30, 1989, Ser. No. 358,435
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—23 **8 Claims**



1. A method for real-time simulation of the far field signature of an array of a plurality of seismic sound sources, comprising:

individually firing each of the respective seismic sound sources of the array;

separately measuring the near field signature of each said seismic sound source;

scaling the respective measured signatures with respect to a reference to compensate for variations in the power output levels of the sources;

correcting the measured, scaled signatures for fire time delays;

deghosting the measured, scaled, corrected signatures;

separately storing in a matrx, as a function of the respective source locations in the array, each of the measured, scaled, corrected and deghosted signatures to form a library of elemental near field seismic source signatures;

occupying sequentially, a plurality of seismic stations in an assigned area of survey;

at each said station, firing the array of seismic sound sources, taken as a whole and recording a seismogram;

for each source location in the array, measuring the instantaneous local firing and environmental parameters at the time of firing;

extacting from said library the elemental signatures coresponding to each said source location;

creating a simulated far field signature that is characteristic of the station occupied, by processing each of the extracted elemental signatures to compensate for variations in the instantaneous local firing and environmental parameters as measured at the respective corresponding source locations in the array; and

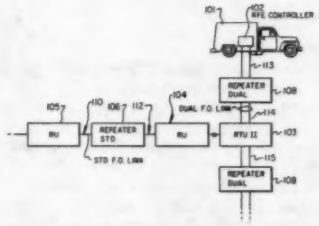
compositing said processed signatures.

4,908,802

APPARATUS FOR FIBER OPTIC SEISMIC EXPLORATION SYSTEM

Donald W. Harvey, Sugarland; Bing-Fai Fung, and Donald J. Bacha, both of Houston, all of Tex., assignors to Geosource, Inc., Fort Worth, Tex.

Filed Nov. 30, 1984, Ser. No. 676,621
Int. Cl.[4] G01V *1/22*
U.S. Cl. 367—149 **2 Claims**



1. Apparatus for communicating signals between, a first and a second adjacent remote units in a distributed seismic exploration system, said system including a controller for generating command word signals to one or more of the remote units, said apparatus comprising:

a first connector for connection to a first fiber optic communication link;

a second connector for connection to a second fiber optic communication link;

means for detecting whether command word signals are received at said first connector or said second connector;

means for restoring said received command word signals and for coupling said restored command word signals to said second connector n response to reception of said command word signals at said first connector and for coupling said restored command word signals to said first connector in response to reception of said command word signals at said second connector;

first circuit means for generating an activating signal at predetermined intervals;

a first power source responsive to said activating signal for generating a constant voltage;

second circuit means responsive to said constant voltage for detecting the receipt of command word signals; and

means for activating a second power source of said appara-

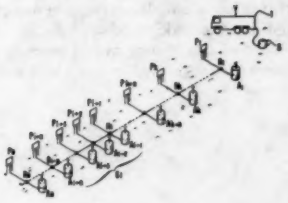
tus in response to the receipt of command word signals and deactivating said first power source, after said second power source has achieved substantially full output voltage.

4,908,803

SEMI-SEQUENTIAL TRANSMISSION METHOD AND SYSTEM USING SIMULTANEOUSLY SEVERAL RADIO TRANSMISSION FREQUENCIES FOR CONNECTING A SEISMIC RECEPTION ASSEMBLY TO A CENTRAL CONTROL AND RECORDING LABORATORY

Joseph Rialan, Meudon, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Feb. 21, 1989, Ser. No. 313,035
Claims priority, application France, Feb. 19, 1988, 88 02104
Int. Cl.[4] G01V 1/22
U.S. Cl. 367—77 **9 Claims**



1. A method for the semi-sequential transmission of signals, by short wave link, between an assembly of N data acquisition apparatus of a seismic reception device and a central control and recording laboratory, by means of a restricted number n of different transmission frequencies less than the number N of acquisition apparatus of said assembly, each data acquisition apparatus being adapted to collect signals received by at least one seismic receiver disposed along a seismic profile to be studied, to digitize and record said signals and, controlled by the central laboratory, to transmit thereto by radio the digitized signals, further comprising:

assigning to each acquisition apparatus of an order number as a function of the position thereof along the seismic profile,

subdividing the assembly of acquisition apparatus into groups each containing at most n acquisition apparatus,

transmitting from the laboratory of a transmission control signal designating the order number of first acquisition apparatus of each of the groups successively,

comparing in each of the N acquisition apparatus of the assembly, the order number designated by the control signal with its own order number and, if a difference between said designated order number and its own order number is compatible with the number n of frequencies available,

switching of the transmission means to a transmission frequency assigned to said difference, the acquisition apparatus of the same group thus sharing out among themselves all the available transmission frequencies, and

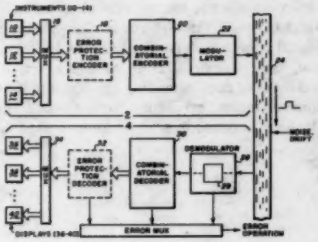
transmitting signals from the acquisition apparatus of the same group to the central laboratory, each one using the particular frequency imposed by said comparison.

4,908,804

COMBINATORIAL CODED TELEMETRY IN MWD

Louis H. Rorden, Los Altos, Calif., assignor to Develco, Inc., San Jose, Calif.

Division of Ser. No. 907,727, Sep. 15, 1986, Pat. No. 4,787,093, which is a continuation of Ser. No. 477,003, Mar. 21, 1983, abandoned. This application Jun. 28, 1988, Ser. No. 212,670
Int. Cl.[4] H04H 9/00
U.S. Cl. 367—81 **5 Claims**



1. In borehole acoustic communication apparatus for communicating a datum, W, from a data source to a data receiver, by a sequence of time displaced, nonadjacent constant width pulses within a fixed time interval T_w, said time interval having beginning and final ends and being independent of said datum W, comprising:

(a) means for ordering a combinatorial set of said sequence of pulses; determining from said datum, a particular one of said sequence of time displaced pulses of said combinatorial set; and generating and transmitting said determined sequence of time displaced pulses from said data source to said data receiver; and

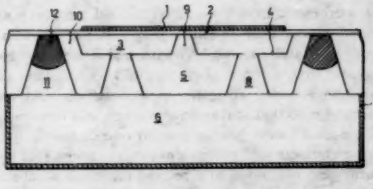
(b) means for recovering said transmitted sequence of time displaced pulses and performing the inverse on the recovered sequence of pulses of determining a particular one of said sequence of time displaced pulses, to obtain a representation of said datum W.

4,908,805

ELECTROACOUSTIC TRANSDUCER OF THE SO-CALLED "ELECTRET" TYPE, AND A METHOD OF MAKING SUCH A TRANSDUCER

Adrianus J. Sprenkels, and Piet Bergveld, both of Enschede, Netherlands, assignors to Microtel B.V., Amsterdam, Netherlands

Filed Oct. 27, 1988, Ser. No. 263,196
Claims priority, application Netherlands, Oct. 30, 1987, 8702589
Int. Cl.[4] H04R 19/00
U.S. Cl. 367—181 **5 Claims**



1. An electroacoustic transducer comprising

a substrate of a semi-conductor material with a recessed portion;

a membrane across said recessed portion, set in vibration in response to an input signal comprising sound frequencies;

a pair of electrodes forming a capacitor and between which an electric field is present, said substrate comprising one of the electrodes of said pair of electrodes, the electrodes being so arranged relatively to the membrane that the capacitance of the capacitor can vary under the influence of vibrations of the membrane, so that acoustic signals are converted into electric signals; and

a layer of an electrically insulating material functioning as a carrier for an electric charge providing an auxiliary electric field between the electrodes, the substrate having a peripheral edge which is raised relatively to said recessed portion, said peripheral edge having a set of openings formed therein, each extending through the substrate; and attachment means extending through said openings to attach the membrane to said peripheral edge.

4,908,806

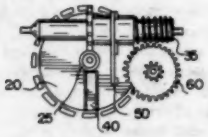
DIRECTIONAL SPRING FOR AC SYNCHRONOUS MOTOR

Robert D. Nickolaus, Chatham, Ill., assignor to Stewart Warner Corporation, Chicago, Ill.

Filed Dec. 1, 1988, Ser. No. 278,583

Int. Cl.[4] C04F *8/00*

U.S. Cl. 368—9 **8 Claims**



1. A timing mechanism comprising:

a housing;

an AC synchronous motor secured to said housing including a plurality of stator and cups surrounding a circular permanent magnet, said plurality of stators and cups connectable to AC power;

a first worm gear axially mounted on said circular magnet;

a second worm gear oriented perpendicular to said first worm gear and intermeshed with said first worm gear so that said first worm gear rotates said second gear;

a directional spring rotatably positioned on said second worm gear so that said spring contacts said housing when said second worm gear is rotated one direction and said spring contacts said permanent magnet when said second worm gear is rotated in a second direction wherein said spring stops said permanent magnet and pushes said permanent magnet in an opposite direction;

means connected to said second worm gear to record time when said second worm gear is rotating;

means to connect said AC sychronous motor to AC power.

4,908,807

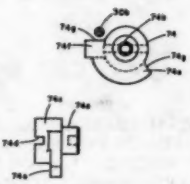
MECHANICAL INTERVAL TIMER WITH CALIBRATION MEANS

Christian M. Jauch, Hewitt, N.J., assignor to Sunbeam Corporation, Downers Grove, Ill.

Division of Ser. No. 544,651, Oct. 24, 1983, Pat. No.

Int. Cl.[4] G04F *1/00*

U.S. Cl. 368—89 **7 Claims**



1. An interval timer of the type having a spring which is manually tensioned when the timer is set and having an escapement gear train through which said spring drives an escape wheel controlled by an escape lever disc, the improvement comprising a pair of plastic frame members in which a plurality of gears forming said gear train are journalled, a shaft supporting one end of said escape lever disc, a rotatable bearing supporting one end of said escape lever disc shaft, said bearing being press fitted into a circular opening in one of said frame members and an eccentric bearing hole in said bearing whereby rotation of said bearing in said opening changes the spacing between the axes of said escape wheel and said escape lever disc.

4,908,808

TIMEPIECE HAVING A MULTIPOLAR ROTOR

Petrus M. J. Knapen, Tilburg, and Jonannes H. Wouterse, Eindhoven, both of Netherlands, assignors to Kinetron B.V., Tilburg, Netherlands

Filed Jun. 23, 1988, Ser. No. 210,225

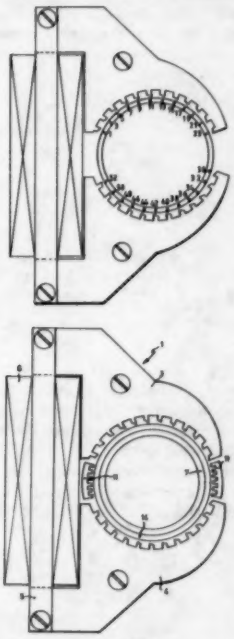
Claims priority, application Netherlands, Jun. 26, 1987, 8701504

Int. Cl.[4] G04F *1/04*

U.S. Cl. 368—157 **14 Claims**

1. Electro-mechanical timepiece, comprising a circuit for generating electric pulses that appear at suitable points of time, a stepper motor controlled by said pulses and comprising a rotor with permanently magnetic poles, a stator and a coil, as well as a gear driven by the action of the stepper motor for driving the clock hands, the stator being constructed from two stator parts located in the same plane as and situated laterally on either side of the rotor, and a yoke, connecting these two parts and extending through said coil, wherein the poles are all situated in a single cross section plane, perpendicular to a rotational axis of the rotor, and form a ringshaped layer which is thin in a radial direction wherein at the radial inner side of

the poles, the rotor includes an uninterrupted circular portion made of a soft-magnetic material, said material providing a



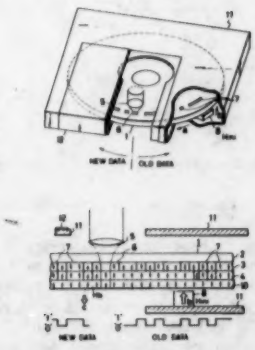
path for a magnetic flux emanating from the rotor as well as a magnetic flux emanating from the stator.

4,908,809

INFORMATION-CARRYING MEDIUM EQUIPMENT FOR MAGNETO-OPTIC READING AND WRITING

Michihiro Tadokoro, and Kazuo Okada, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,556
Claims priority, application Japan, May 21, 1987, 62-126668
Int. Cl.[4] G11B *13/04, 11/12*
U.S. Cl. 369—13 **5 Claims**



1. An information-carrying medium equipment for magneto-optic reading and writing, comprising:

an information-carrying medium having, in order, a first magnetic recording layer having a Curie temperature Tc1 and a coercive force Hc1, a second magnetic layer having a Curie temperature Tc2 and a coercive force Hc2, a third magnetic layer having a Curie temperature Tc3 and a coercive force Hc3, the third magnetic layer is premagnetized in a uniform direction parallel to the thickness of said third layer for use as a biasing layer, wherein said first, second and third magnetic layers are stacked on a substrate in the above order and said medium is illuminated by a laser beam through said substrate, the Curie temperature Tc2 is higher than the Curie temperature Tc1 but lower than the Curie temperature Tc3, and the coercive force Hc2 is less than the coercive forces Hc1 and Hc3;

a housing for the information-carrying medium; and

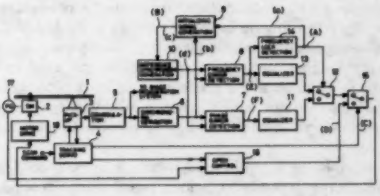
magnetizing means disposed in the housing facing the information-carrying medium, for initializing the direction of magnetization of the second magnetic layer of the information-carrying medium in a designated direction.

4,908,810

METHOD AND APPARATUS FOR CONTROLLING A SPINDLE SERVO USING PICKUP POSITION AND SHIFT INFORMATION

Takayuki Oie, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,361
Claims priority, application Japan, May 6, 1986, 61-103502
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—50 **6 Claims**



1. A method for controlling a spindle servo in an information recording disk regenerating apparatus including a pickup shiftable radially across an information recording disk on which information is recorded with a varying recording angular velocity so as to read information recorded on said disk, a spindle servo loop for controlling a rotational frequency of a spindle motor for driving said disk according to an error between a regenerative synchronizing signal and a reference synchronizing signal generated by a reference synchronizing generator, the regenerative synchronizing signal being included in a read output of said pickup, and a tracking servo for indicating one of an open and closed state of the spindle servo loop, said method comprising the steps of:

determining position information of said pickup in the radial direction of the disk and shift direction information of said pickup;

controlling said spindle motor according to the position and shift direction information when said spindle servo loop is open;

detecting a frequency difference between said regenerative synchronizing signal and said reference synchronizing signal;

controlling said spindle motor according to said frequency difference after said spindle servo loop is closed;

detecting, when said spindle servo loop is closed, a phase difference between said regenerative synchronizing signal and said reference synchronizing signal;

determining a frequency lock condition when said frequency difference is such that the frequencies of said regenerative synchronizing signal and the reference synchronizing signal are substantially equal; and

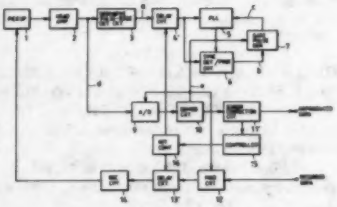
controlling said spindle motor according to said detected phase difference after said frequency lock condition has been determined.

4,908,811

METHOD AND APPARATUS FOR DATA RECORDING AND REPRODUCING WITH ERROR REDUCTION

Fumihiko Yokogawa, and Hiroyuki Hirano, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,063
Claims priority, application Japan, Dec. 17, 1987, 62-319564
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—54 **5 Claims**



1. A method of data recording and reproducing for use with a recording and reproducing apparatus which includes a pickup for recording on or reading from a recorded medium, a reproducing section which includes a first delay circuit for delaying a signal representing the data signals read from the recording medium, and a recording section which includes a second delay circuit which delays a modulated signal whose modulation represents the data to be recorded comprising the steps of:

(a) modulating a data signal which is to be recorded by a recording/reproducing clock signal which has been delayed by said first delay circuit,

(b) recording said modulated data signal with a time delay provided by said second delay circuit,

(c) reproducing the data signal recorded in step (b) using the recording/reproducing clock signal delayed by said first delay circuit,

(d) calculating the error ratio from said reproduced data signal,

(e) determining if the calculated error ratio is greater than a predetermined maximum allowable value,

(f) adjusting the delay interval provided by said first delay means if the error ratio is greater than said allowable value,

(g) repeating steps (b) through (e), and

(h) again adjusting the delay interval provided by said first delay circuit if the error ratio is still greater than said allowable value.

4,908,812

SYNCHRONIZING SIGNAL REPRODUCING CIRCUIT IN A DISC PLAYBACK DEVICE

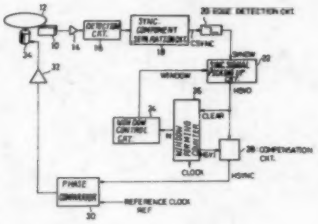
Shinzi Aoshima, and Sadayuki Narusawa, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 10, 1986, Ser. No. 905,864
Claims priority, application Japan, Sep. 13, 1985, 60-202829; Sep. 19, 1985, 60-207355
Int. Cl.[4] H04N *5/76*; G11B *5/09*
U.S. Cl. 369—59 **13 Claims**

1. A synchronizing signal reproducing circuit in a disc playback device comprising:

an assumed synchronizing signal detection circuit for taking out an assumed synchronizing signal having the possibility of being a true synchronizing signal from a signal reproduced from a disc;

a window establishing circuit for establishing a window, on the basis of a preceding true synchronizing signal, which includes a timing at which a true synchronizing signal is expected to occur; and



a synchronizing signal picking up circuit for picking up the assumed synchronizing signal detection circuit as a true synchronizing signal if the assumed synchronizing signal occurs in said window;

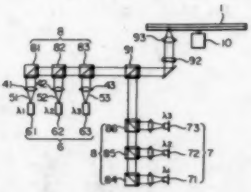
said window having a future side range which is wider than a past side range with respect to said timing at which the true synchronizing signal is expected to occur.

4,908,813

WAVELENGTH MULTIPLEXING OPTICAL RECORDING APPARATUS

Masahiro Ojima; Motoyasu Terao, both of Tokyo; Yoshio Taniguchi, Hino; Shuji Imazeki, Kodaira, and Yasushi Tomioka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,453
Claims priority, application Japan, Dec. 10, 1986, 61-292310
Int. Cl.[4] G11B *11/00*
U.S. Cl. 369—94 **9 Claims**



1. A wavelength multiplexing optical recording apparatus comprising:

a laser source radiating a plurality of laser beams of different wavelengths;

an optical system for focusing said laser beams; and

an optical recording medium consisting of a plurality of recording layers having wavelength sensitivities so that said layers are subjected to recording or reproduction selectively by said laser beams focused by said optical system, said layers being laminated with a distance between adjacent layers being made consistent to a difference of focal positions of said laser beams attributable to the chromatic aberration of said optical system, so that said laser beams are focused on recording layers having corresponding wavelength sensitivities.

4,908,814

METHOD OF PHOTOTHERMAL INFORMATION RECORDING READING AND ERASING

Vyacheslav V. Petrov; Dmitry A. Grinko; Alexandr A. Antonov, and Andrei A. Krjuchin, all of Kiev, U.S.S.R., assignors to Institut Problem Modelirovanija v Energetiki AN Ukr. SSR, Kiev, U.S.S.R.

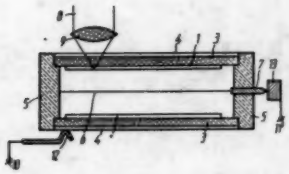
PCT No. PCT/SU87/00016, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO87/04839, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 5, 1987, Ser. No. 135,029

Claims priority, application U.S.S.R., Feb. 7, 1986, 3134136

Int. Cl.[4] G11B *7/00*; G01D *15/10*; H04N *1/23*

U.S. Cl. 369—100 1 Claim



1. A method for photothermal information recording, reading, and erasing, which consists in that, in order to produce each information unit from a sequence of information units having a two-level deep surface relief pattern in a recording medium (1) disposed on a substrate, in the process of photothermal information recording, and for reading and erasing of information, this recording medium (1) is exposed to a modulated electromagnetic beam (8) localized to a spot size of the order of one information unit-pit, said recording medium (1) being made of a material capable of spreading when soft over the substrate, characterized in that, prior to photothermal information recording, the surface of the recording medium (1) is charged, the electromagnetic beam (8) acting on the recording medium (1) and localized to a spot size of the order of one information unit for photothermal information recording and erasing has more energy that is required for softening the material of the recording medium (1) but less than to destroy the material of this recording medium (1), and for reading the energy of the beam (8) is less than the softening energy of the material of the recording medium (1), the surface of the recording medium (1) being discharged prior to erasing of information.

4,908,815

OPTICAL RECORDING SYSTEM UTILIZING PROPORTIONAL REAL-TIME FEEDBACK CONTROL OF RECORDING BEAM INTENSITY

David P. Gregg, 3650 Helms Ave., Culver City, Calif. 90230; Stephen K. Shu, 18081 Santa Cecilia, Fountain Valley, Calif. 90708, and Kitchener C. Wilson, 415 Calle Las Caleros, Santa Barbara, Calif. 93109

Filed Feb. 22, 1988, Ser. No. 158,535

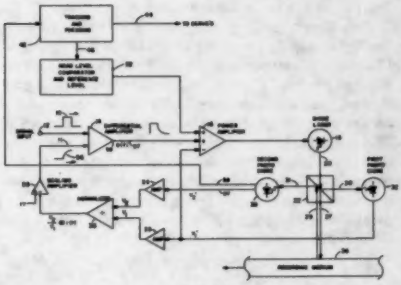
Int. Cl.[4] G11B *7/125*

U.S. Cl. 369—116 15 Claims

6. An optical recording system for recording data on a radiation-sensitive stratum in an optical recording medium including;

(a) means for directing onto said stratum an incident radiant beam modulated to contain data in accordance with a command input signal to be recorded on said recording medium, said radiant beam causing said recording medium to emit a secondary radiant beam inversely representing the power required by said stratum to record the data of said incident beam, and

(b) means for comparing substantially in real time the amplitudes of said command input signal and said secondary beam to control the power level of said incident beam and



to maintain said incident beam at the power level required by said stratum to properly record said data.

4,908,816

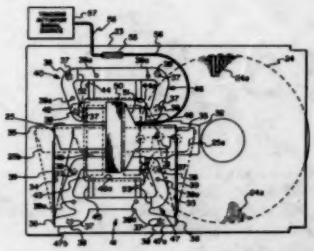
VOICE COIL MOTOR WITH LINEARIZED FORCE CONSTANT

Patrick J. Champagne, Cupertino, and John L. Grimsley, Los Altos, both of Calif., assignors to Laserdrive Limited, Santa Clara, Calif.

Filed Dec. 20, 1988, Ser. No. 287,798

Int. Cl.[4] G11B *7/00, 5/54, 21/08*

U.S. Cl. 369—215 1 Claim



1. Tracking actuator apparatus for an optical beam addressable information storage disk drive system adapted to move a read/write head rapidly along a stroke path parallel with a planar surface of a recording medium and generally parallel with a line normal to a plurality of closely spaced parallel data tracks formed on said planar surface thereby to position a focused optical beam generated within the head on one of said data tracks, said apparatus comprising:

elongated head means for generating said optical beam, said head means having first and second end portions with said optical beam emanating from one of said end portions;

flexure means for suspending said head means with smooth, friction-free translation motion along said stroke path between extremes thereof;

a plurality of magnetic circuit means for establishing mutually isolated magnetic fields across a plurality of elongated air gaps individually disposed on opposite sides of the head means intermediate the end portions thereof, the elongated dimensions of each of said air gaps being parallel with the elongated dimension of said head means and longitudinally centered with respect to the center of said stroke path, each of said magnetic circuit means including an elongated permanent magnet and an elongated flux return pole spaced in parallel from the magnet to form said air gaps, each of said magnets having an air gap face

area shaped to have a reduced width at the center relative to the widths of the face at the ends of the magnet to maintain a substantially constant force constant throughout the length of said stroke path;

electromagnetic coil means having a plurality of turns formed coaxially about the longitudinal center line of said head means and secured to the head means intermediate the end portions thereof, said coil means having end turn segments spaced symmetrically away from said head means and disposed in said air gaps, said flexure means suspending said head means with said turn segments centered between the extremes of said stroke path;

and means for supplying tracking actuator signals to said coil means to cause said coil and head means to move longitudinally along said stroke path with a substantially uniform force constant through the full length of said stroke path.

4,908,817

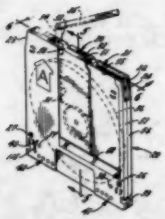
CARTRIDGE FOR OPTICAL DATA DISCS

Patrick B. Sandell, Bartlett, and Albert Ditzig, Hoffman Estates, both of Ill., assignors to Opticord, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 930,874, Nov. 14, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 120,614

Int. Cl.[4] G11B *23/03, 25/04*

U.S. Cl. 369—291 **45 Claims**



1. A protective cartridge for a data information disc, comprising a pair of interlocking shells enclosing said disc, a sliding door movable between a closed position for covering said disc and an open position for exposing said disc during a read operation, said shells defining a track along a forward edge portion of said cartridge, said door including a slider mounted for sliding movement in said track and a pair of separate shutters each having a first planar portion overlapping a respective one of the shells and a forward portion, and said shutter forward portions being formed with means for positively engaging said slider.

4,908,818

MULTIPLEX COMMUNICATION ARRANGEMENT CAPABLE OF SELECTIVELY MONITORING ACTIVE MULTIPLEXERS AND OF SIMULTANEOUSLY CHECKING AN INPUT TO A STAND-BY DEMULTIPLEXER

Osamu Kawano, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 25, 1987, Ser. No. 66,940

Claims priority, application Japan, Jun. 25, 1986, 61-147045

Int. Cl.[4] H04J *3/14*

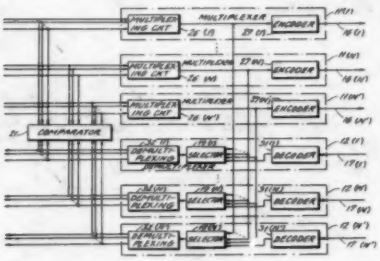
U.S. Cl. 370—15 **4 Claims**

1. A multiplex communication arrangement which comprises:

(A) N+1 multiplexers, N being a positive integer greater than 1, each multiplexer being for connection to a respective transmission channel and comprising a multiplexing circuit for multiplexing a plurality of multiplexer input signals applied thereto into a multiplexed signal and an encoder for encoding said multiplexed signal into an encoded signal of self-checking codes for transmission to its respective said transmission channel;

(B) N+1 demultiplexers each for connection to a respective reception channel, each demultiplexer comprising:

(1) a decoder for decoding a demultiplexer input signal applied thereto into a decoder output signal, said demultiplexer input signal being in a form of said self-checking codes and being received through its respective reception channel, said decoder checking for errors in said demultiplexer input signal applied thereto;



(2) a selector for selecting, as a selected signal, one of said decoder output signal and the multiplexed signal produced by one of said multiplexers that said selector selects as a selected multiplexer; and

(3) a demultiplexing circuit for demultiplexing said selected signal into a plurality of demultiplexer output signals; and

(C) a comparator for carrying out bit by bit comparison of the multiplexer input signals of said selected multiplexer with the demultiplexer output signals which are produced from one of said demultiplexers for the multiplexed signal produced in said selected multiplexer.

4,908,819

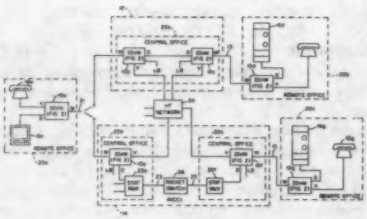
INTEGRATED DATA VOICE MULTIPLEXER SUPPORTING HANDSHAKE AND LOOP-BACK PROTOCOLS

Donald R. Casady, and Ioan V. Teodorescu, both of Tulsa, Okla., assignors to Seiscor Technologies, Inc., Tulsa, Okla.

Continuation of Ser. No. 59,440, Jun. 8, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 293,531

Int. Cl.[4] H04J *3/14*

U.S. Cl. 370—15 **19 Claims**



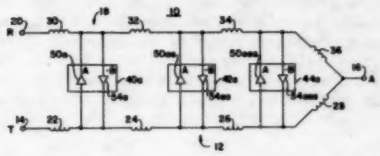
3. Apparatus as in claim 1 where the baud rate of the signalling signal is less than the baud rate of the data signal.

4,908,820

NON-RECIPROCAL BIDIRECTIONAL DUPLEXER

Yalcin Ayasli, Lexington, Mass., assignor to Hittite Microwave Corporation, Woburn, Mass.

Filed Mar. 29, 1989, Ser. No. 330,413
Int. Cl.[4] H04B *1/58, 3/23*
U.S. Cl. 370—38 **7 Claims**



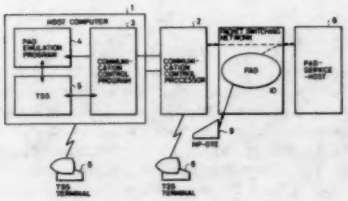
1. A non-reciprocal, bidirectional duplexer comprising:
- a first transmission medium extending from a first terminal to a third terminal;
- a second transmission medium extending from a second terminal to said third terminal; and
- a plurality of non-reciprocal, bidirectional phase shifting elements coupling said transmission mediums and spaced along them; each said phase shifting element including means for amplifying a signal in a first direction from said first to said second transmission medium, and for amplifying a signal in a second direction from said second to said first transmission medium, and means for establishing a phase differential between the signals moving in said first and second directions.

4,908,821

DATA COMMUNICATIONS SYSTEM HAVING A PACKET SWITCHING NETWORK

Toshimitsu Sirato, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,293
Claims priority, application Japan, Oct. 1, 1986, 61-234180
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **6 Claims**



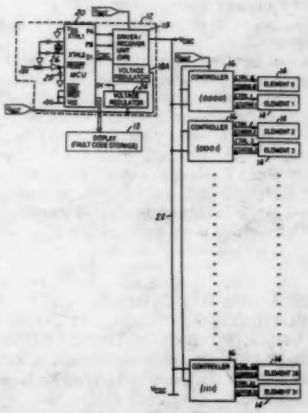
1. A data communications system having a packet switching network which includes a first packet assembly and disassembly (PAD) means for connecting non-packet terminal units to the packet switching network, comprising:
- a PAD service host connected to said packet switching network and having a packet function which gives service to the non-packet terminal units via said first PAD means and communicates with said first PAD means in a particular protocol defined by communications from said non-packet terminal units through said first PAD means; and
- a computer system connected to said packet switching network and having a second packet assembly and disassembly (PAD) means for assembling and disassembling packets exchanged between said packet switching network and said computer system, a time sharing system and a plurality of terminal units connected to said time sharing system, said computer system further including a protocol conversion means, being connected between said PAD service host and said time sharing system, for executing a protocol conversion so as to respond to said PAD service host the same as said first PAD means responds.

4,908,822

ELECTRICAL DEVICES COMMAND SYSTEM, SINGLE WIRE BUS AND SMART DUAL CONTROLLER ARRANGEMENT THEREFOR

Thomas R. Wroblewski, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 7, 1988, Ser. No. 280,916
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—85 **5 Claims**



1. A multiplex system within a motor vehicle for commanding and monitoring the status of a plurality of electrical devices or elements disposed throughout the motor vehicle, each of the elements having command terminals for receiving commands in the form of a discrete voltage signal for activating or deactivating each of the elements, one of the command terminals also being used to provide a status indication of each of the elements in the form of a current signal upon being commanded, said system comprising:
- (a) a bi-directional, single wire bus for transmitting in a first direction a series of square wave, double duty cycle, voltage signals used for commanding ON or OFF the plurality of elements and a series of current signals transmitted in a second direction used for indicating the ON and OFF status of the plurality of elements;
- (b) a plurality of smart dual controllers disposed throughout the motor vehicle, each one of said dual controllers being disposed near a pair of elements for commanding ON or OFF one of the pair of elements, each of said dual controllers having:
  - (1) a single input/output terminal connected by a single wire to a single point along said bus for receiving the square-wave voltage signals from said bus and;
  - (2) integration means for converting the square-wave voltage signal into a dual-amplitude, sawtooth-pulse waveform containing address and data information wherein a first amplitude pulse represents LOW bits and a second amplitude pulse represents HIGH bits;
  - (3) detection means for detecting a first portion of an address code from said sawtooth-pulse waveform in order to enable said dual controller to command one of the pair of elements when the detected address code

matches a preprogrammed address of said dual controller, said detection means also including means for detecting a second portion of the address code used for selecting which one of the pair elements to command ON or OFF;

(4) means for detecting a data bit code from said sawtooth pulse waveform in order to determine whether to turn ON or OFF the selected element;

(5) means for commanding the selected element ON or OFF, said commanding means including means for transmitting a current signal back over said bus indicative of the status of the element after commanding the element ON or OFF;

(c) a driver and receiver means, receiving power from a power source of the vehicle and connected to said single-wire bus, for generating the series of square-wave, double-duty cycle voltage signals used by each of said dual controllers, said driver and receiver means also including means for receiving the status of the elements indicating current signals transmitted over said bus;

(d) display means for displaying the status of the plurality of elements; and

(e) a microcomputer means interconnecting said driver and receiver means and said display means for (1) writing logic commands to said driver and receiver means for controlling the generating of the series of square-wave, double-duty cycle voltage signals used for placing address and command information on said bus, (2) reading the current signals indicative of the status of the commanded element; (3) establishing a history of performance of each of the commanded elements; and (4) transferring updated status information to said display means.

4,908,823

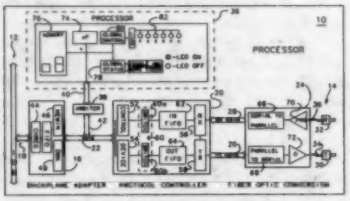
HYBRID COMMUNICATIONS LINK ADAPTER INCORPORATING INPUT/OUTPUT AND DATA COMMUNICATIONS TECHNOLOGY

Randolph B. Haagens, Roseville, and Thomas A. Keaveny, Rocklin, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 29, 1988, Ser. No. 150,262

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—85.1 **17 Claims**



1. An adapter between a backplane, providing a connection of data terminal equipment (DTE), and a frontplane, providing a connection to a communication media, comprising:

backplane adapter means responsive to a first plurality of processor control signals received at a first port, and asynchronous control and data signals received from said DTE in a plurality of channels, for generating at a second port synchronous control and data signals therefrom and for receiving at said second port synchronous signals and for generating therefrom at said first port said asynchronous signals;

protocol controller means responsive to a second plurality of processor control signals, receiving said synchronous signals generated at said second backplane adapter port, for generating therefrom signals formatted according to a predetermined protocol suitable for transmission over said communication midia, and receiving signals formatted according to said protcol, for generating therefrom said synchronous signals received at said second backplane adapter port;

converter means connected to said frontplate receiving said formatted signals generated by said protocol controller means for generating therefrom signals onto said communication media and receiving signals from signals received by said protocol controller; and

processor means responsive to said synchronous control signals, having a memory operabley connected to said backplane adapter means and to said protocol controller means, for generating said first and said second plurality of processor control signals; said memory being directly accessible (DMA) to said backplane adapter means and to said protocol controller means.

4,908,824

COMMUNICATIONS SYSTEM COMPRISING A RING-SHAPED NETWORK WHICH IS PROVIDED SO AS TO PROVIDE A COMMUNICATIONS NETWORK IN THE SUBSCRIBER LINE REGION OF A DIGITAL SWITCHING EQUIPMENT

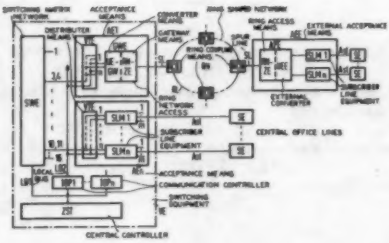
Gerhard Leibe; Klaus Kuhlmann, and Albert Weiss, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,230

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726716

Int. Cl.[4] H04J *3/02*; H04Q *11/04*

U.S. Cl. 370—85.15 **7 Claims**



1. A communication system comprising, a digital switching equipment having a first local bus system by which a central controller means communicates with a switching matrix network means formed as a time-stage and with at least on communications controller, and which is equipped with a further local bus system by which the communications controller communicates with subscriber line equipment mounted in an acceptance means, a distributor means mounted in the acceptance means which distributes the bus system coming from the communications controller and at least one PCM-oriented message channel in-coming from terminals of the switching matrix network means to respectively n subscriber line equipment terminals in parallel, said subscriber line equipment are connectible respectively with m subscriber equipments by central office lines for analog or digital transmission capabilities where m and n are integers, a ring-shaped network mounted in the subscriber line region of the switching equipment as an offering network for transmitting information groups and having a ring line in which a plurality of ring coupling devices are mounted and to which a respective ring-shaped network access means is connected by a respective spur line, and whose ring-shaped network-access means is connected to at least one ring network subscriber equipment, hardware equipment and software for operating, administering and monitoring switching equipments, office lines, subscriber equipments and the ring-shaped network, comprising a gate-

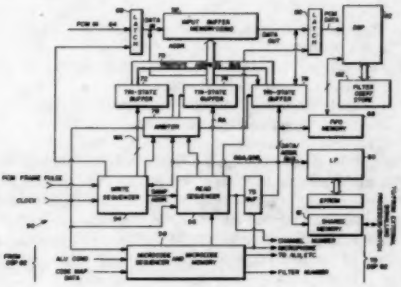
way means (GWE) formed of a converter means (UE-GW) and a ring-shaped network access means (RN-ZE) for coupling the switching equiment to the ring-shaped network (RN) mounted in an acceptance means (AE); said gateway means (GWE) connected to the switching equipment (VE) by said converter means (UE-GW); said gateway means (GWE) connected to the ring-coupling means (RCB) by the ring-shaped network access means (RN-ZE) which matches the signalling and message information to line network transmission procedures; at least one further ring-shaped coupling means (RCB) mounted in said ring-shaped network (RN), an external acceptance means (AEE) in which is mounted a network access means (RN-ZE) and an external converter means (UE, SLM) and to which a maximum of n subscriber equipments (SLM) are connected to said at least one further ring-shaped coupling means with a spur line (SL); external subscriber equipment (SE) connected to said subscriber equipment (SE) of the switching equipment network and connected to the subscriber line equipment (SLM) by central office lines; and said the ring-shaped network (RN) and said switching equipment network are operated, administered and monitored by said switching equipment (VE) and/or by said gateway means (GWE).

4,908,825

MEMORY ORGANIZATION AND OUTPUT SEQUENCER FOR A SIGNAL PROCESSOR

Matthew J. J. Vea, Rowlett, Tex., assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 8, 1988, Ser. No. 179,269
Int. Cl.[4] H04J 3/12
U.S. Cl. 370—110.3 **21 Claims**



1. A specialized tone receiver of the type which is connected to a digital signal bus carrying a pulse code modulated digital signal sample stream corresponding to a speech channel, said receiver comprising:

input buffer memory means for temporarily storing said bus digital signal sample stream;

write sequencer means connected to said memory means and also connected to receive said signal sample stream for writing said sample stream into said input buffer memory means in a first sequential chronological order;

read sequencer means connected to said memory means for reading said written sample stream from said memory means in a second sequential chronological order opposite said first chronological order; and

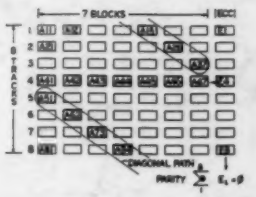
digital signal processing means connected to receive said read sample stream for detecting at least one prespecified frequency component within said sample stream.

4,908,826

STORED DATA ERROR CORRECTION SYSTEM

Friedrich R. Hertrich, Boulder, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 5, 1988, Ser. No. 141,061
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—40.1 **17 Claims**



16. A method of generating an error correction code (ECC) for parallel track data recording on a recording medium in which several adjacent tracks are defined, each track including a series of blocks of recorded information arranged in a repeating alternating sequence of a group of data blocks and at least one associated ECC block, comprising

defining an ECC entity having a predetermined width encompassing several adjacent tracks and a predetermined length encompassing several consecutive data blocks in each track, and

algebraically combining data destined for a first set of data blocks on one track within said ECC entity with data destined for a second set of other blocks on other tracks within said ECC entity to form an ECC for an ECC block within said ECC entity on said one track,

wherein said ECC entity forms an n x n matrix having n tracks each with at least n−1 data blocks and 1 ECC block,

wherein said ECC is determined by the algorithm:

$$E_t = \sum_{b=1}^{n-1} (+)\,(A_{tb}(+)\,A_{|t+b| \bmod n,b}),$$

where E_t is the ECC for track t and the tracks are numbered from 1 to n, respectively, b is the block number, the blocks being numbered from 1 to n−1, respectively, the ECC block being the nth block in the ECC entity, mod n designating arithmetic within the wraparound number set comprised of a repeating sequence of integers from 1 to n.

whereby the data in any single missing or defective one of said first or second set of blocks can be algebraically reconstructed.

4,908,827

FORWARD ERROR CORRECTION SYSTEM

John Gates, San Jose, Calif., assignor to TIW Systems, Inc., Sunnyvale, Calif.

Filed Jul. 27, 1987, Ser. No. 77,800
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—43 **19 Claims**

1. A method of coding blocks of data received at an input for transmission in a satellite transmission system, the data being transmitted in frames each comprising a defined number of N bits, the method comprising the steps of

encoding said blocks of data utilizing an encoder designed to satisfy R=I/O where R must be less than one,

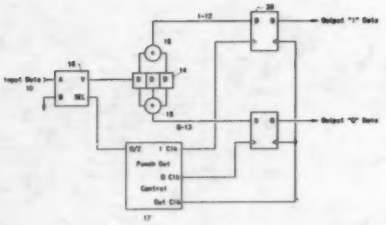
I is the number of unencoded bits in each said block of data fed into the encoder,

O is the number of coded output bits coming out of the encoder,

said encoding step including the steps of feeding each said

block of I unencoded bits and a number of tail bits L into said encoder,

operating on said I+L unencoded bits in said encoder to produce a number of encoded output bits O greater than N due to coding of said tail bits, and



punching out a number of bits equal to O-N from said encoded data to provide said frame of encoded data comprising N bits.

4,908,828

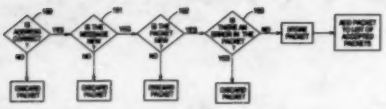
METHOD FOR ERROR FREE MESSAGE RECEPTION

Terry Tikalsky, Sunnyvale, Calif., assignor to Indesys, Inc., Sunnyvale, Calif.

Filed Dec. 29, 1987, Ser. No. 138,852

Int. Cl.[4] G06F *11/10*; G08C *25/00*

U.S. Cl. 371—69.1 **16 Claims**



1. A method for one-way transmission of a digitally encoded message over a broadcast network to a plurality of receivers, including the steps of:

(a) generating a number of packets, each packet including a portion of the digitally encoded message, a header, and an error code, where each header includes a message code identifying the message to which the packet belongs and a packet code identifying the position of the packet within the message;

(b) transmitting the set of packets comprising the message to the receivers;

(c) cyclically retransmitting to the receivers, for a selected number of transmission cycles, the set of packets comprising the message;

(d) at each receiver, comparing the message code and packet code of each received packet with an internally stored list of message codes and packet codes of previously accepted packets, and performing an error check on each packet whose message code and packet code are not included in the list; and

(e) storing, as part of the list, the message code and packet code of each packet for which no errors are detected, and storing each said packet for which no errors are detected.

4,908,829

LASER FREQUENCY STABILIZATION BY ACTIVE RESONATOR LENGTH REGULATION

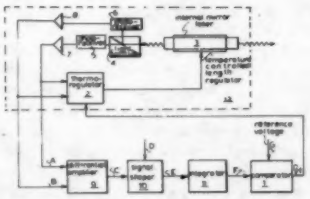
Vassil P. Kruglii, and Stanislav P. Shurulinkov, both of Sofia, Bulgaria, assignors to Su "Kliment Ohridski", Sofia, Bulgaria

Filed Nov. 23, 1988, Ser. No. 276,212

Claims priority, application Bulgaria, Nov. 30, 1987, 82012

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—29 **4 Claims**



1. A method of thermoregulation of an internal mirror laser having a temperature controlled resonator length regulator which comprises the steps of:

(a) continuously energizing said laser to cause said laser to generate a light output at a back mirror thereof;

(b) deriving from said light output an electric signal which is a function of the temperature of the laser resonator and of a rate of thermal expansion thereof;

(c) comparing said electric signal with a reference signal; and

(d) initiating thermoregulation of the length of said resonator by controlled energization of the temperature controlled length regulator only upon equalization of said electric signal and said reference signal, and thereafter continuously controlling the length of said resonator in response to said light output.

2. The method defined in claim 1 wherein said electric signal is formed by:

(b_1) splitting said light output into two differently polarized light outputs;

(b_2) generating respective electrical signals from each of said differently polarized light outputs;

(b_3) amplifying each of the electric signals generated by said differently polarized light outputs;

(b_4) feeding the amplified electric signals to a differential amplifier and obtaining a difference signal therefrom;

(b_5) subjecting said different signal to signal shaping; and

(b_6) integrating a signal resulting from step (b_5) to produce an integrated signal which is the electric signal which is a function of the temperature of the laser resonator and of a rate of thermal expansion thereof.

4,908,830

BURIED TYPE SEMICONDUCTOR LASER DEVICE

Toshihiko Yoshida; Haruhisa Takiguchi, both of Tenri; Shinji Kaneiwa, Nara; Hiroaki Kudo, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 897,337, Aug. 15, 1986. This application Feb. 22, 1989, Ser. No. 313,982

Claims priority, application Japan, Aug. 21, 1985, 60-184650; Sep. 10, 1985, 60-201161; Sep. 11, 1985, 60-202463; Sep. 12, 1985, 60-203627; Sep. 19, 1985, 60-207869

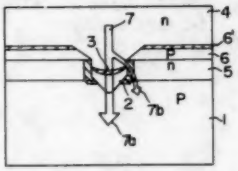
Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **6 Claims**

1. In a buried type semiconductor laser device, the device comprising:

a multi-layered epitaxial growth crystal comprising a striped laser-oscillation operating area on a semiconductor substrate, said laser operating area comprising a buffer layer

having the same conductivity type as said substrate, an active layer, and a cladding layer having a conductivity type different from that of said substrate, said cladding layer being disposed over the entire top surface of said device, wherein said laser-oscillation operating area is formed within a striped channel reaching said substrate



through a burying layer disposed on said substrate and is sandwiched between one part of said burying layer and another part of said burying layer through a diffusion region having the same conductivity type as said substrate formed on the inner wall of said channel so as to electrically isolate said burying layer from said cladding layer.

4,908,831

BURIED TYPE SEMICONDUCTOR LASER DEVICE

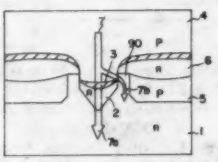
Toshihiko Yoshida; Haruhisa Takiguchi, both of Tenri; Shinji Kaneiwa, Nara; Hiroaki Kudo, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Division of Ser. No. 897,337, Aug. 15, 1986, Pat. No. 4,839,900. This application Feb. 22, 1989, Ser. No. 314,363

Claims priority, application Japan, Aug. 21, 1985, 60-184650; Sep. 10, 1985, 60-201161; Sep. 11, 1985, 60-202463; Sep. 12, 1985, 60-203627; Sep. 19, 1985, 60-207869

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **2 Claims**



1. In a buried type semiconductor laser device, the device comprising:

a multi-layered epitaxial growth crystal comprising a striped laser-oscillation operating area on a semiconductor substrate, said laser operating area comprising a buffer layer having the same conductivity type as said substrate, an active layer, and a cladding layer formed on the entire surface of said device and having a conductivity type different from that of said substrate, wherein said laser oscillation operating area is formed within a striped channel formed in a mesa of said substrate and is sandwiched between one part of a burying layer having a conductivity type different from that of said substrate and another part of said burying layer, which are disposed outside of the mesa of said substrate, through the portion of said substrate positioned between the laser-oscillation operating area and each part of the burying layer so as to electrically isolate said burying layer from said cladding layer.

4,908,832

HIGH EFFICIENCY MODE-MATCHED SOLID-STATE LASER WITH TRANSVERSE PUMPING

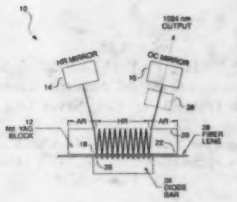
Thomas M. Baer, Mountain View, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 231,192, Aug. 11, 1988, which is a continuation of Ser. No. 103,557, Sep. 30, 1987, Pat. No. 4,785,459, which is a continuation-in-part of Ser. No. 35,530, Apr. 7, 1987, Pat. No. 4,756,003, which is a continuation-in-part of Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056. This application Feb. 23, 1989, Ser. No. 314,655

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] H01S *3/091*

U.S. Cl. 372—75 **35 Claims**



1. A mode-matched diode-pumped solid state laser, comprising:

a block of laser material having a pair of opposed sides,

cavity forming means positioned around the block to define a laser cavity having a tightly folded zig-zag resonator portion within the block between the opposed sides having vertices at a preselected fold angle,

a plurality of laser diode pumping sources separated from said block of laser material,

a lens for focusing radiation from the laser diode pumping sources onto at least one of the opposed sides of the block of laser material so as to substantially align the radiation from said laser diode pumping sources with the vertices of the zig-zag portion of the resonator,

said fold angle being greater than about 5° and less than about 20° and selected to substantially match the mode volume with pump radiation from said laser pump sources.

4,908,833

DISTRIBUTED FEEDBACK LASER FOR FREQUENCY MODULATED COMMUNICATION SYSTEMS

Andrew R. Chraplyvy, Matawan; Thomas L. Koch, Holmdel, and Robert W. Tkach, Little Silver, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 27, 1989, Ser. No. 303,594

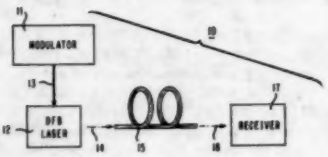
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—96 **4 Claims**

1. A lightwave transmitter including a distributed feedback laser and means for frequency modulating said laser, said laser comprising a semiconductor heterostructure including a gain medium having a characteristic wavelength λ_p and a modal refractive index n and an integrated feedback means coupled optically to said gain medium, said integrated feedback means including spatially periodic perturbations of a transmission characteristic of said semiconductor heterostructure and having an effective period Λ_{eff}, said transmitter CHARACTERIZED IN THAT,

said effective grating period is related to said characteristic wavelength as $\Lambda_{eff} > \lambda_p M/2n$, where M is an integer



greater than or equal to 1 for characterizing an order of the integrated feedback means.

4,908,834

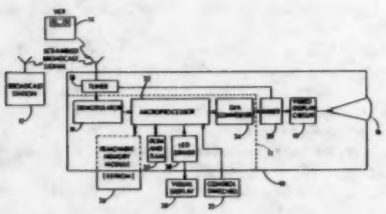
HIGH SECURITY PAY TELEVISION SYSTEM

John D. Wiedemer, c/o Signal Security Technologies, 1127 Texas Bank & Trust Tower, 6161 Savoy Dr., Houston, Tex. 77036

Continuation-in-part of Ser. No. 660,512, Oct. 12, 1984, Pat. No. 4,696,034. This application Sep. 22, 1987, Ser. No. 100,577

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—5 **4 Claims**



1. A television receiver adapted for use in a pay television system in which broadcast signals are scrambled comprising

turner means for receiving the broadcast signal and for separating the broadcast signal into at least two components;

a decoder circuit connected to receive a first one of the components from the tuner means;

a mixer to combine the output of the decoder circuit with the first component of the output of the tuner means;

a television screen and associated driver circuitry to display the output of the mixer;

an electrically alterable memory module containing a first memory portion in which at least one pre-written external code is carried and a second memory portion in which program information may be entered;

a microprocessor in the decoder circuit programmed to (1) read the external code from the memory module, (2) derive a broadcast code from the video signal, (3) generate a descrambling signal from the external code and output the descrambling signal to the mixer, and (4) write information about programs actually being descrambled, as determined by the broadcast code, in the memory module so that use of the receiver to view scrambled broadcasts can be billed on a usage basis; and

means for descrambling a second of the separated components of the broadcast signal from the tuner means separately from the other components so that full, descrambled composite video signal is not available at any one point in the receiver.

4,908,835

INFORMATION RECORDING MEDIUM

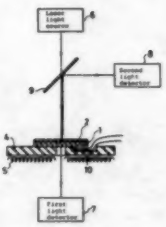
Kenichi Nishiuchi, Moriguchi; Nobuo Akahira, Yawata; Noboru Yamada, Hirakata, and Eiji Ohno, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 924,157, Oct. 27, 1986, abandoned, which is a division of Ser. No. 755,653, Jul. 16, 1985, abandoned. This application Jun. 29, 1989, Ser. No. 373,666

Claims priority, application Japan, Jul. 18, 1984, 59-148801

Int. Cl.[4] G01N *25/00*

U.S. Cl. 374—45 **4 Claims**



4. A method of measuring reliability of an information recording medium which comprises an information recording thin film which is formed by a substance having a state of high optical density when it is heated substantially to its darkening temperature and thereafter is slowly cooled and a state of low optical density when it is heated substantially to said melting point and thereafter is rapidly cooled, which method comprises the steps of:

annealing said film by heating to a temperature which is lower than said melting point for a predetermined time period for changing a low optical density state of said film to a high optical density state,

heating a part of said film at least once to its melting point,

rapidly cooling said part of said film after heating,

measuring a transition temperature of said film after cooling, and

comparing said transition temperature with a predetermined reference temperature.

4,908,836

METHOD AND APPARATUS FOR DECODING MULTIPLE BIT SEQUENCES THAT ARE TRANSMITTED SIMULTANEOUSLY IN A SINGLE CHANNEL

Craig K. Rushforth, Kaysville; Zhenhua Xie, and Robert T. Short, both of Salt Lake City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 11, 1988, Ser. No. 255,809

Int. Cl.[4] H04K *1/00*

U.S. Cl. 375—1 **10 Claims**

1. A method of decoding superimposed data bits including the steps of:

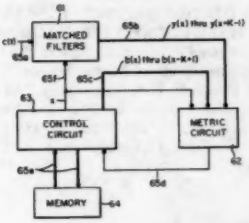
receiving a composite signal that is formed by coding multiple bit sequences with respective spreading codes and transmitting the coded bit sequences simultaneously and asynchronously over a single channel;

comparing the content of several registers, each of which contains an estimate of a particular bit sequence in said composite signal and a metric for that sequence, to determine the largest metric M_{max} and the corresponding bit sequence b_s;

evaluating a new pair of metrics for the very next bit b(x) in said composite signal which follows said bit sequence b_s by using estimated "0" and "1" values for bit b(x), bits from said sequence b_s which immediately precede bit b(x),

and matched filter outputs for bits in said composite signal which immediately follow bit b(x);

replacing the register which contains said bit sequence b_z with two registers, one of which contains the bit sequence b_z b(x)=0 and the metric M_{max} plus the above evaluated metric for b(x)=0, and the other of which contains the bit



sequence b_z b(x)=1 and the metric M_{max} plus the above evaluated metric for b(x)=1;

repeating said comparing, evaluating, and replacing steps multiple times; and thereafter,

decoding said composite signal as the bit sequence in the register which contains the largest metric.

4,908,837

RECEIVER FOR SPREAD SPECTRUM COMMUNICATION

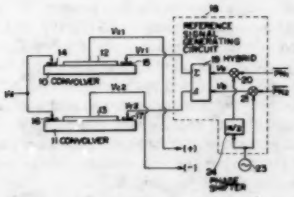
Masaharu Mori; Masahiro Hamatsu, and Shigeo Akazawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,398

Claims priority, application Japan, Aug. 4, 1987, 62-196042

Int. Cl.[4] H04K *1/02*

U.S. Cl. 375—1 **13 Claims**



7. A receiver for spread spectrum communication, comprising:

a first convolver having first and second inputs and an output;

a second convolver having first and second inputs and an output;

reference signal generating means for generating a first reference signal $PN_1(t)\cdot\cos(\omega_o t+\psi)+PN_2(t)\cdot\sin(\omega_o t+\psi)$ and a second reference signal $PN_1(t)\cdot\cos(\omega_o t+\psi)-PN_2(t)\cdot\sin(\omega_o t+\psi)$, where $PN_1(t)$ is a first pseudo-noise code, $PN_2(t)$ is a second pseudo-noise code, and ω_o and ϕ are respectively the frequency of a first CW signal and a phase;

first means for supplying a received spread spectrum signal to said first input of each of said first and second convolvers; and

second means for supplying each of said first and second reference signals to the second input of a respective one of said first and second convolvers.

4,908,838

CORRELATION DETECTING CIRCUIT OPERABLE IN A LOW FREQUENCY

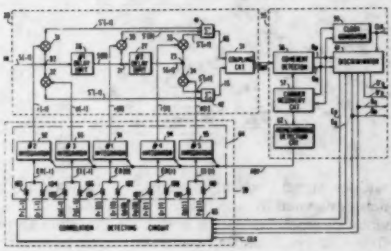
Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,552

Claims priority, application Japan, Sep. 22, 1987, 62-236314

Int. Cl.[4] H04B *3/18*

U.S. Cl. 375—15 **15 Claims**



1. A correlation detecting circuit for use in an adaptive equalizer system comprising a transversal filter for filtering a received signal into an equalized signal in response to a plurality of controllable tap gains and a demodulator for demodulating said equalized signal into a reproduced clock signal, a reproduced data sequence, and a digital error signal, said received signal carrying a transmission data sequence digitized by a reference clock signal, said reproduced clock signal being a reproduction of said reference clock signal, said reproduced data sequence being a reproduction of said transmission data sequence, said digital error signal being related to said reproduced data sequence, said correlation detecting circuit including logic operation carrying out means for carrying out an exclusive logic operation on a plurality of input signals derived from said reproduced clock signal, said reproduced data sequence, and said digital error signal to produce a plurality of correlation signals which represent cross-correlation between said reproduced data sequence and said digital error signal and are collectively used in controlling said controllable tap gains, wherein the improvement comprises:

divider means for frequency dividing said reproduced clock signal to produce a divided clock signal; and

serial-parallel converting means coupled to said divider means and responsive to said digital error signal and to said reproduced data sequence for converting said digital error signal and said reproduced data sequence into said input signals in synchronism with said divided clock signal.

4,908,839

CHANNEL SWITCHING SYSTEM

Hideaki Morimoto, and Kiyoshi Funayama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 939,979, Dec. 10, 1986, abandoned. This application Apr. 5, 1989, Ser. No. 333,835

Claims priority, application Japan, Dec. 11, 1985, 60-279749; Dec. 11, 1985, 60-279750

Int. Cl.[4] H04L *1/22, 1/04*

U.S. Cl. 375—40 **5 Claims**

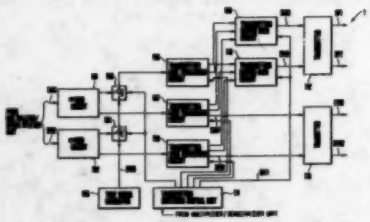
1. A channel switching system in a digital radio communication system using at least two regular channel and two or more standby channels for transmitting a test signal therethrough in the standby condition, thereby permitting at least one of said regular channels to be synchronously switched to one of said standby channels,

said channel switching system comprising at the receiving side of said digital communication system:

control signal generator means operating so that when two

or more standby channels are in standby condition it generates a control signal to designate them in turn, and when only one standby channel is in standby condition, it generates a control signal to designate the channel.

synchronizing switching means for selectively outputting



said test signal transmitted via each of said standby channels designated by said control signal, and

standby channel monitoring means for detecting an output from said synchronizing switching means to monitor the communication quality of the standby channel placed in standby condition on the basis of a result detected.

4,908,840

PSK MODULATION WITH AN ERROR CORRECTION MEMORY

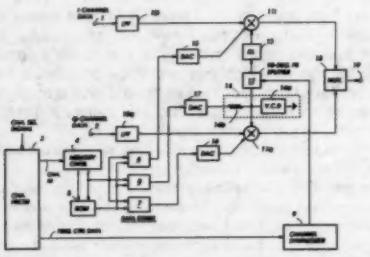
Kazuo Kakimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 273,538

Claims priority, application Japan, Nov. 20, 1987, 62-291708

Int. Cl.[4] H03C *3/08*

U.S. Cl. 375—60 **12 Claims**



1. A modulation circuit comprising:

a binary PSK (phase shift keying) balanced modulator having two signal input ports and a carrier input port to which a variable frequency carrier is supplied for modulating said variable frequency carrier with a digital signal of a selected one of a plurality of channels, said modulator having an inherent operating characteristic variable as a function of the frequency of said carrier;

memory means for storing a plurality of digital error correction signals in storage locations corresponding to said plurality of channels, each of said error correction signals being representative of a deviation of said inherent operating characteristic of said modulator when operating at a particular frequency of said carrier from a predetermined operating characteristic;

means for generating said carrier and varying the frequency thereof corresponding to the selected channel;

means for addressing said memory means and reading a digital error correction signal from one of said storage locations corresponding to said selected channel;

a digital-to-analog converter for converting the digital error correction signal read out of said memory means into an analog error correction signal; and

differential summing means for differentially summing the digital signal of said selected channel with said analog error correction signal and applying the summed signals to said signal input ports of said PSK balance modulator.

4,908,841

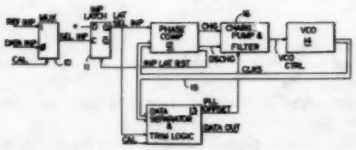
DATA DECODING CIRCUIT INCLUDING PHASE-LOCKED LOOP TIMING

Michael Leis; Michael J. Muchnik, both of Framingham; Elmer Simmons, Whitman, all of Mass.; Russell Brown, Nepean, Canada, and Bernardo Rub, Shrewsbury, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 30, 1987, Ser. No. 115,238

Int. Cl.[4] H03D *3/24*

U.S. Cl. 375—81 **18 Claims**



1. A data decoding circuit for receiving an input signal comprising a pulse stream and generating in response thereto a data signal and timing signals comprising:

A. phase-locked loop means comprising:

i. voltage controlled oscillator means for generating timing signals in response to a control signal, said voltage controlled oscillator means generating a free-running timing signal defined by a series of pulses having a selected frequency and a bit cell timing signal defining a bit cell and a receive time timing signal both defined by a series of pulses of one half said selected frequency and alternatingly contemporaneous with pulses of said free-running timing signal; and

ii. phase comparison means comprising:

a. charge means connected to receive said input signal and said bit cell timing signal for generating a charge signal for a period of time starting from the beginning of said input signal to the end of said bit cell; and

b. discharge means connected to said charge means and connected to receive said receive time timing signal for generating a discharge signal for a period of time starting from the end of said charge signal to said receive time timing signal;

iii. charge pump means connected to said phase comparison means and said voltage controlled oscillator means for generating the control signal, the control signal having a voltage level related to said charge and discharge signals and an offset signal;

B. data separator means for generating said data signal and said offset signal in response to said input signal and said timing signals, said offset signal representing the degree of correlation between the timing signals and the input signal as received by said data separator means.

4,908,842

FLASH SYNCHRONIZED GATED SAMPLE CLOCK GENERATOR

Galen Collins, 10740 Ridgeview Ave., San Jose, Calif. 95127

Filed Feb. 14, 1989, Ser. No. 311,360

Int. Cl.[4] H04N *5/05*

U.S. Cl. 375—119 **20 Claims**

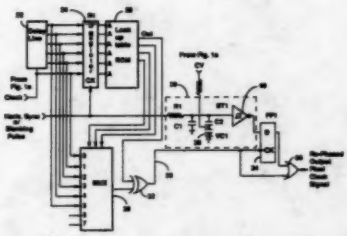
1. Digital flash synchronizer apparatus for instantaneously re-phasing an asynchronous clock signal at a first frequency with a selected characteristic of a second signal from a desired

source at a second frequency, wherein said first frequency is higher than the second frequency, said apparatus comprising:

delay line means disposed to receive said clock signal and having a multiplicity of equally spaced taps for presenting a multiplicity of said clock signals at different phases, one with respect to the others;

first register means disposed to receive said second signal as a trigger and receives the clock signals from the taps of the delay line means for storing the signal levels of the clock signal and the signals at the taps of the delay line means in response to said second signal;

look-up table means connected to said first register means to receive the signal levels therefrom as the address to the table for identifying the phase of the clock to be selected that agrees most closely with the selected characteristic of said second signal;



multiplexer means coupled to receive said clock signal and each of the signals at the taps of said delay line means as input signals and the output signals from said look-up table means as the control input signals for selecting the preliminary re-phased clock signal from the input signals to said multiplexer means;

delay means for delaying said second signal by at least the total propagation delay of the look-up table means and the multiplexer means;

second register means coupled to receive the output signal from said delay means for producing said delayed second signal in response to said preliminary re-phased clock signal; and

OR gate means coupled to receive at one input terminal the delayed second signal from said second register means and the preliminary re-phased clock signal from the multiplexer means for producing a final re-phased clock signal on the output terminal of said OR gate means.

4,908,843

LIGHT DISTRIBUTOR FOR AN X-RAY DIAGNOSTICS INSTALLATION

Arthur Gall, Langensendelbach; Gerhard Kuetterer, Erlangen, and Helmut Richter, Baiersdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,561

Claims priority, application Fed. Rep. of Germany, May 25, 1988, 8806828

Int. Cl.[4] H05G 1/64

U.S. Cl. 378—99 **13 Claims**

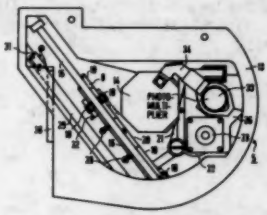
1. In an x-ray diagnostics installation having an x-ray image intensifier with an associated optics system which generates a first beam path for light forming an output image of said x-ray image intensifier, and a plurality of pick-up components for said light, the improvement of a light distributor comprising:

a housing adapted for coupling to said optics system into which said light which comprises said first beam path is admitted;

means in said housing on which said light from said x-ray image intensifier is incident for generating a second beam path of the output image of the x-ray image intensifier;

a carriage;

means for displacing said carriage in a plane disposed obliquely relative to said second beam path so that said carriage does not intersect said second beam path; and



first and second mirror surfaces mounted flat on said carriage so that one of said mirror surfaces is moveable into said second beam path upon displacement of said carriage, wherein one of said mirror surfaces is being partially reflecting.

4,908,844

APPARATUS FOR DETECTING ERROR OF DETECTOR

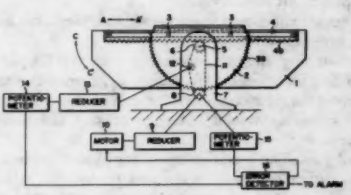
Shinji Hasegawa, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1988, Ser. No. 173,816

Claims priority, application Japan, Mar. 31, 1987, 62-75873

Int. Cl.[4] A61B 6/04

U.S. Cl. 378—209 **8 Claims**



1. A control apparatus for a raisable bed of an X-ray fluoroscopic imaging system, comprising:

a first gear provided to a side portion of said bed;

a rack provided in a longitudinal direction of said bed;

a pinion, meshed with said rack, for moving said bed in a horizontal direction;

a second gear meshed with said first gear, for raising said bed;

a motor for integrally rotating said pinion and said second gear through a power transmission means so as to raise said bed;

first and second potentiometers, which are connected to two rotating shafts of said pinion and said second gear, and have identical detection characteristics, for detecting rotational angles of said two rotating shafts;

means for detecting a difference between outputs from said first and second potentiometers; and

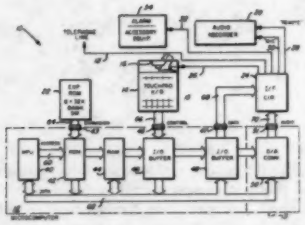
first means for comparing the difference with a predetermined value and for, when the difference is larger than the predetermined value, generating a first error detection signal representing an error of at least one of said first and second potentiometers.

4,908,845

AUDIO/TELEPHONE COMMUNICATION SYSTEM FOR VERBALLY HANDICAPPED

Paul D. Little, Kilgore, Tex., assignor to Joyce Communication Systems, Inc., Longview, Tex.

Division of Ser. No. 849,692, Apr. 9, 1986, Pat. No. 4,785,402.
This application Jun. 27, 1988, Ser. No. 212,295
Int. Cl.[4] H04M *1/274, 1/64*
U.S. Cl. 379—51 **8 Claims**



1. An interface circuit for establishing direct interconnection between a digital to analog converter and a speaker, and establishing communication between a programmed computer, the digital to analog converter and a telephone line and permitting telephone communication thereover by transmitting regenerated audio messages from the digital to analog converter and receiving third-party generated telephone messages in response to a plurality of computer generated signals, comprising

first amplifier circuit means for receiving said regenerated audio messages, amplifying said messages and applying said amplified messages to the speaker,

second amplifier circuit means for receiving said regenerated audio messages, amplifying said messages and applying said amplified messages as an output from said second amplifier circuit means,

isolation circuit means for isolating the telephone line from the interface circuit,

first switching means cooperating with the telephone line and said isolation circuit means and responsive to a first signal from the computer for completing the telephone line connection to a first side of said isolation circuit means, and

second switching means cooperating with a second side of said isolation circuit means and responsive to a second signal from the computer for coupling the amplified regenerated audio messages from said second amplifier circuit means to said second side of said isolation circuit means, said second switching means further responsive to the absence of said second signal from the computer for coupling said second side of said isolation circuit means as a second input to said first amplifier circuit means.

4,908,846

MOBILE TELEPHONE TERMINAL HAVING FUNCTION TO PERFORM CALL CLEAR PROCESS

Tsuguo Maru, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,966
Claims priority, application Japan, Apr. 20, 1988, 63-98728
Int. Cl.[4] H04Q *7/01*
U.S. Cl. 379—58 **24 Claims**

1. A mobile telephone terminal comprising:

vehicle

battery means mounted on a mobile support;

portable unit means for radio communicating with a base station;

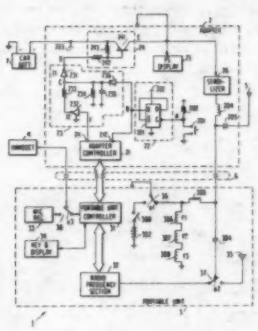
adapter means connected between said battery means and said portable unit means for fixing said portable unit means to said mobile support and for supplying power from said battery means to said portable unit means;

means for generating a waiting state signal when said telephone terminal is in a waiting state;

means for generating a communication state signal when said telephone terminal is in a communication state;

power switch means for manually generating a switch signal;

delay circuit means for delaying said switch signal by a first predetermined period of time in response to said waiting state signal to produce a first delay signal and for delaying



said switch signal by a second predetermined period of time in response to said communication state signal to produce a second delay signal, said first predetermined period of time being shorter than said second predetermined period of time;

power supply switch means responsive to one of said first and second delay signals for stopping power supply from said battery to said portable unit; and

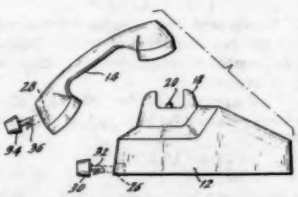
call clear means responsive to said switch signal for performing a call clear process, said second predetermined period of time being long enough to allow said call clear means to complete said call clear process.

4,908,847

ADAPTOR SET FOR CONVERTING STANDARD TELEPHONE INTO CORDLESS TELEPHONE

Charles J. Hannon, Clinton, and Bruce M. Gallo, Chester, both of N.J., assignors to Telcor, Inc., Chester, N.J.

Filed Nov. 10, 1988, Ser. No. 269,986
Int. Cl.[4] H04M *1/02*
U.S. Cl. 379—61 **15 Claims**



1. A conversion kit for converting a conventional non-cordless telephone to a cordless telephone, the conversion kit comprising:

a first transmitter/receiver for transmitting and receiving waves and a respective terminal means for enabling the first transmitter/receiver to be electrically connected to a non-cordless telephone base; and

a second transmitter/receiver for transmitting and receiving waves and for communicating wirelessly with the first

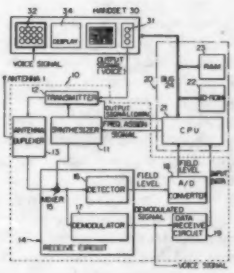
transmitter/receiver, the second transmitter/receiver having a respective terminal means for connecting the second transmitter/receiver to a non-cordless telephone handset.

4,908,848

APPARATUS FOR CONTROLLING CALLS IN A MOBILE COMMUNICATION SYSTEM

Tetsuya Hanawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 12, 1988, Ser. No. 180,553
Claims priority, application Japan, Apr. 13, 1987, 62-88695
Int. Cl.[4] H01M *1/26*
U.S. Cl. 379—63 **7 Claims**



1. An apparatus for controlling a call in a mobile communication system provided in a mobile station having a handset, the mobile station operated by a subscriber to a mobile communication service and having functions for restricting calls, said apparatus comprising:

first storing means for storing first information of functions for restricting call, where the first information cannot be rewritten, said first storing means including

restriction command storing means for storing restriction commands, each indicating restriction of a specific function of said mobile communication system; and

selection command storing means for storing a selection command identifying one of said restriction commands in said restriction command storing means;

second storing means for storing second information based upon the first information from said first storing means, where the second information can be rewritten, the second information including one of the restriction commands from said first storing means in accordance with said selection command stored in said storing means except when said selection command indicates a restrictive mode may be changed;

rewriting means for rewriting the second information stored in said second storing means in accordance with input information from the handset; and

restriction means for restricting at least one of incoming and outgoing call operations by the mobile communication system in accordance with the second information stored in said second storing means.

4,908,849

TELEPHONE ANSWERING DEVICE CAPABLE OF REPEATEDLY PLAYING BACK OUTGOING MESSAGE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

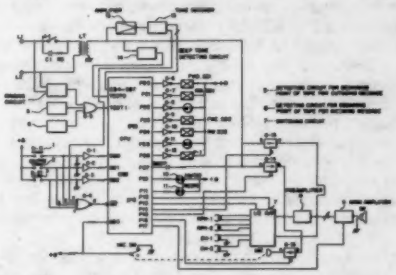
Filed Nov. 30, 1988, Ser. No. 278,952
Claims priority, application Japan, Dec. 1, 1987, 62-303805
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—67 **4 Claims**

1. A telephone answering device for automatically answering an incoming call and recording an incoming message from a calling party, which device is capable of repeatedly playing back an outgoing message, comprising;

a recording medium for recording the outgoing message;

a recording medium for recording or storing the incoming message;

means for forming a loop circuit in response to the incoming call, recording the incoming message from the calling party on the incoming message recording medium after said outgoing message is transmitted, and thereafter returning the device to a standby mode;



means for playing back again the same outgoing message from the beginning in response to a special signal sent out by the calling party when he wants to listen to the outgoing message again; and

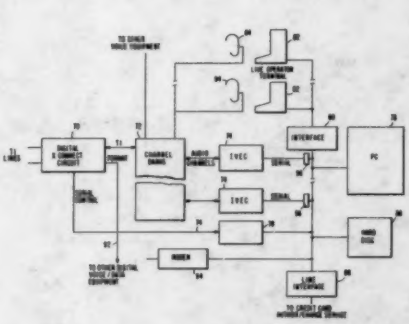
means for driving the incoming message recording medium and recording the incoming message from the calling party on the incoming message recording medium after said outgoing message is played back once more again from the beginning, and thereafter returning the device to the standby mode.

4,908,850

VOICE SERVICES NETWORK WITH AUTOMATED BILLING

Ronald K. Masson, Topanga, and Michael W. Edelson, Simi Valley, both of Calif., assignors to American Communications & Engineering, Inc., Simi Valley, Calif.

Filed Jan. 11, 1988, Ser. No. 142,676
Int. Cl.[4] H04M *3/50, 3/56, 3/58*
U.S. Cl. 379—88 **56 Claims**



17. A method of communication comprising the steps of

(a) providing at least one voice message system coupled to at least one phone line for receiving incoming calls on said at least one phone line, providing verbal prompts to the callers from predetermined messages stored in digitized form, and for receiving information from callers over said at least one phone line in touch tone coded form in response to the verbal prompts; and

(b) providing a data base computer coupled to the at least one voice message system for receiving information from the voice message system relating to each call and storing the same in a form organized at least in part by reference to each respective caller, said data base computer being coupled to a line to a credit verification service and automatically communicating with the credit verification service for credit verification purposes for callers for which such information is not already stored in the data base computer.

50. A method of communication comprising the steps of:

(a) providing at least one voice message system coupled to at least one phone line for automatically receiving incoming calls on said at least one phone line, providing verbal prompts to the callers from predetermined messages stored in digitized form, and for receiving information from callers over said at least one phone line in touch tone coded form in response to the verbal prompts, the voice message system having the capability of communication with a banking card service;

(b) receiving incoming calls by the voice message system and providing verbal prompts to each caller to encourage the same to enter the caller's banking card information by way of the touch tone keyboard;

(c) receiving in touch tone form and detecting the banking card information from a caller; '(d) automatically communicating with the banking card service to authorize credit in accordance with the banking card information; and

(e) switching the respective one of the calls to a voice mail system;

(f) all of the foregoing steps (b) through (e) being accomplished without operator intervention.

4,908,851

FACSIMILE APPARATUS OPERABLE IN FACSIMILE OR CONVERSATION MODE

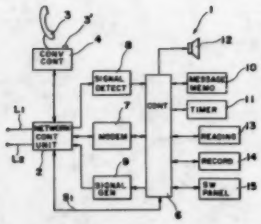
Matahira Kotani; Masayuki Hachinoda, both of Nara; Toshihiro Matsuda, Higashiosaka; Takashi Nakajiri, Nara, and Motohiko Hayashi, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 28, 1988, Ser. No. 250,408

Claims priority, application Japan, Sep. 30, 1987, 62-247630; Sep. 30, 1987, 62-247631; Sep. 30, 1987, 62-247632; Sep. 30, 1987, 62-247633; Sep. 30, 1987, 62-247634

Int. Cl.[4] H04M *11/00*; H04N *1/32*

U.S. Cl. 379—100 **13 Claims**



1. A facsimile communication apparatus which is operable under either one of a facsimile mode for transmitting facsimile signals from a calling station along a telephone line to a called station, or a conversation mode for transmitting voice signals from the calling station along the telephone line to the called station, said facsimile communication apparatus at the called station comprising:

network control means for automatically connecting said called station to said telephone line upon receipt of a telephone call from the calling station;

timer means for counting a first predetermined time period, said timer means being activated in response to the automatic connection by said network control means;

detecting means, operatively connected to said timer means, for detecting if a facsimile request signal from the calling station is present within said first predetermined time period;

facsimile control signal producing means, responsive to said detecting means, for producing facsimile control signals when said detecting means detects said facsimile request signal within said first predetermined time period, thereby enabling the facsimile mode;

said timer means counting a second predetermined time period in response to said facsimile request signal not being detected by said detecting means within said first predetermined time period;

message producing means, responsive to lapse of said first predetermined time period, for producing a message, at said called station, indicating that an operator at said calling station desires said facsimile apparatus to operate in said conversation mode; and

conversation control means, responsive to said message producing means, for producing a control signal to enable said facsimile apparatus to operate in the conversation mode, within said second predetermined time period;

wherein said facsimile control signal producing means responsive to said timer means for producing facsimile control signals upon the lapse of said second predetermined time period, thereby enabling said facsimile mode.

4,908,852

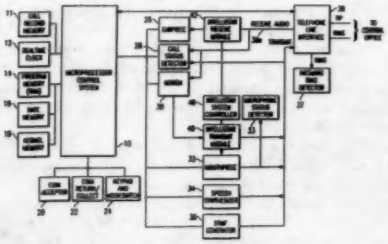
METHOD AND APPARATUS FOR ALTERING THE ACCESS FORMAT OF TELEPHONE CALLS

John A. Hird, Dallas; Lindsey D. Owen, and Michael R. Rice, both of Carrollton, all of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Jan. 23, 1989, Ser. No. 300,796

Int. Cl.[4] H04M *15/30*, *17/02*

U.S. Cl. 379—130 **35 Claims**



1. A localized telecommunications device utilized by a user placing a telephone call through a telecommunications network, comprising:

circuitry at the device for receiving a destination telephone number and billing format information for the call from the user, said billing format information indicating an account to be billed for the call which does not correspond to an account associated with the localized telecommunications device; and

circuitry at the device for placing the call to said destination number through the telecommunications network such that the call is billed to said account associated with the

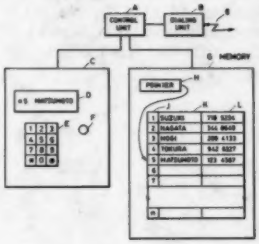
localized telecommunications device despite the account indicated by said billing format information of the user.

4,908,853

DIALING APPARATUS

Kohichi Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,652
Claims priority, application Japan, May 29, 1987, 62-137052
Int. Cl.[4] H04M *1/27*
U.S. Cl. 379—355 **6 Claims**



1. A dialing apparatus for accessing a destination station, comprising:

a memory for storing information, including a name and a dialing number, for each of a plurality of destination stations;

display means, arranged to display at least the name of one destination station at a time from among the plurality of destination stations;

a key for altering the names of destination stations displayed on said display means in a predetermined order;

control means for shifting the names of destination stations displayed on said display means, in the predetermined order according to the input of said key;

a selector for selecting a dialing number; and

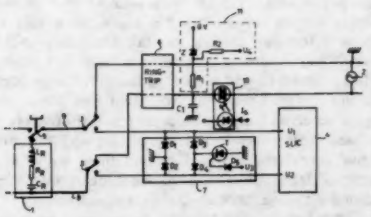
dialing means for dialing the dialing number of the destination station displayed on said display means based on the selection made by said selector.

4,908,854

APPARATUS FOR CONNECTING AND DISCONNECTING A RINGING SIGNAL TO A CALLED SUBSCRIBER

Bengt G. Löfmark, Skärholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 12, 1988, Ser. No. 242,979
Claims priority, application Sweden, Oct. 8, 1987, 8703890
Int. Cl.[4] H04M *1/74, 3/00*
U.S. Cl. 379—373 **4 Claims**



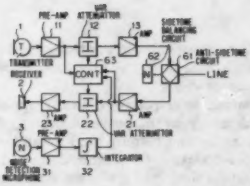
1. Apparatus in a telecommunication system for connecting and disconnecting a ringing signal to a called subscriber, such that for ringing a signalling means is alternatingly connected to an AC voltage source, said ringing signal then starting, and to a semiconductor circuit, whereupon said ringing signal is interrupted, characterized in that for preventing the occurrence of current transients when the signalling means (1) is connected to the semiconductor circuit (4), said apparatus includes a two-way switching circuit (10) connected in series to said AC voltage source (2) for disconnecting the AC voltage to the signalling means when the current through it has zero crossing, and a discharge circuit (11) connected to said signalling means (1) for discharging said means before said means is connected to the semiconductor circuit (4), such that the voltage across said signalling means at a connection to said semiconductor circuit lies within a given voltage interval.

4,908,855

ELECTRONIC TELEPHONE TERMINAL HAVING NOISE SUPPRESSION FUNCTION

Juro Ohga, Kamakura; Kensaku Fujii, Yamato; Hiroyuki Masuda, Kawasaki, and Yuka Sato, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 15, 1988, Ser. No. 219,607
Claims priority, application Japan, Jul. 15, 1987, 62-177679; Mar. 17, 1988, 63-64271
Int. Cl.[4] H04M *1/60*
U.S. Cl. 379—387 **17 Claims**



1. An electronic telephone terminal having a handset including a transmitter and a receiver, both having substantially linear acoustic-to-electric transduction characteristics, and having a surrounding noise suppression function, comprising:

a variable attenuator for controlling a gain of a transmission system;

noise detection means for detecting surrounding noise; and

control means for controlling said variable attenuator in such a manner that when a sound pressure level input to said transmitter exceeds a predetermined threshold value, said gain is fixedly set to a constant value, and when said input sound pressure level is equal to or below said predetermined threshold level, said gain is controlled in response to a change in said surrounding noise level detected by said noise detection means.

4,908,856

SWITCHING VOLTAGE REGULATOR FOR AN INTERFACE CIRCUIT IN A TELEPHONE SUBSCRIBER LINE

Vanni Poletto, Alessandria, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza Mi, Italy

Filed Mar. 9, 1988, Ser. No. 165,808
Claims priority, application Italy, Mar. 24, 1987, 19817 A/87
Int. Cl.[4] G05F *1/44*
U.S. Cl. 379—413 **12 Claims**

7. A switching voltage regulator comprising:

first and second transistors interconnected in a Darlington arrangement;

an ON-state sensor coupled to the collector of the first transistor;

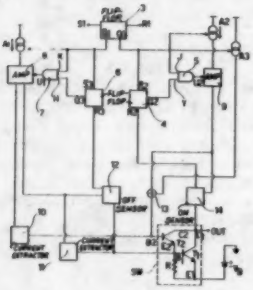
an OFF-state sensor coupled to the base of the first transistor;

a first current extractor coupled to the base of the first transistor;

a second current extractor coupled to the base of the second transistor;

control means coupled to receive an on signal for turning the first and second transistors on, an off signal for turning the first and second transistors off, and coupled to a source of power, the base of the second transistor, the ON-state sensor, the OFF-state sensor, the first current extractor and the second current extractor;

the control means, in response to the on signal, coupling current from the source of power to the base of the second transistor to turn the first and second transistors on and



the ON-state sensor on, the control means in response to an ON-state signal from the ON-state sensor turning the ON-state sensor off;

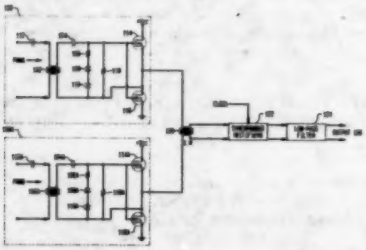
the control means in response to an off signal ceasing coupling of current from the power source to the base of the second transistor and turning the first and second current extractors on to cause the first and second transistors to turn off, and turning the OFF-state sensor on, the control means in response to an OFF-state signal from the OFF-state sensor turning the first and second current extractors off and the OFF-state sensor off.

4,908,857

ISOLATED DRIVE CIRCUIT

Robert V. Burns, and Sanjay Gupta, both of Phoenix, Ariz., assignors to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed May 22, 1989, Ser. No. 355,220
Int. Cl.[4] H04M *3/02*
U.S. Cl. 379—418 **11 Claims**



1. An isolated drive circuit for a power amplifier, comprising:

input pulse transformer means having PWM input signals with a dc offset voltage capacitively coupled to primary windings thereof;

dc restoration circuit means coupled to a secondary winding of said input transformer means, and having an output;

power FET switching amplifier means for increasing the voltage level of the output of said dc restoration circuit means to a higher voltage level; and

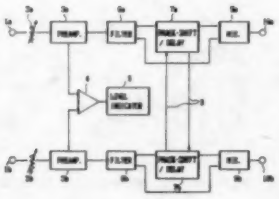
resistance means coupled between the gates and sources of said power FET switching amplifier means to prevent the power FET switching amplifier means from conducting when said input PWM pulse train is not present at said input pulse transformer means.

4,908,858

STEREO PROCESSING SYSTEM

Matsuo Ohno, 17-7, Minami-aoyama 3-chome, Minato-ku, Tokyo, Japan (107), assignor to Matsuo Ohno and Kabushiki Kaisha Asaplan, both of Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,181
Claims priority, application Japan, Mar. 13, 1987, 62-58435
Int. Cl.[4] H04S *1/00*
U.S. Cl. 381—1 **6 Claims**



1. A stereo processing system having a first channel circuit and a second channel circuit, which comprises:

(a) a first filter coupled to said first channel circuit for separating an audio signal input to said first channel circuit into a plurality of bands, said first filter having a first output for outputting a first portion of an output signal thereof and a second output for outputting a remaining portion of the output signal thereof;

(b) a second filter coupled to said second channel circuit for separating an audio signal input to said second channel circuit into a plurality of bands, said second filter having a first output from outputting a first portion of an output signal thereof and a second output for outputting a remaining portion of the output signal thereof;

(c) a first phase-shift/delay circuit coupled to said first channel circuit for receiving the first portion of the output signal of said first filter from the first output thereof and phase-shifting and delaying the received signal for each of the bands separated by said first filter;

(d) a second phase-shift/delay circuit coupled to said second channel circuit for receiving the first portion of the output signal of said second filter from the first output thereof and phase-shifting and delaying the received signal for each of the bands separated by said second filter;

(e) a pair of input/output circuits interconnecting said first phase-shift/delay circuit and said second phase-shift-/delay circuit for inputting a signal from said second phase-shift/delay circuit to said first phase-shift/delay circuit and inputting a signal from said first phase-shift-/delay circuit to said second phase-shift/delay circuit for mixing a signal received from said first filter with the signal received from said second phase-shift/delay circuit in said first phase-shift/delay circuit and for mixing a signal received from said second filter with the signal received from said first phase-shift/delay circuit in said second phase-shift/delay circuit, respectively;

(f) a first mixing circuit coupled to said first channel circuit so as to mix a signal received from the second output of said first filter with an output signal of said first phase-shift/delay circuit;

(g) a second mixing circuit coupled to said second channel

circuit so as to mix a signal received from the second output of said second filter with an output signal of said second phase-shift/delay circuit; and

(h) a phase detector-delay circuit coupled to the output of said first mixing circuit and the output of said second mixing circuit for detecting and delaying a portion of the output signal from said first mixing circuit having a 180° phase-shift with respect to the output signal from said second mixing circuit and a portion of the output signal from said second mixing circuit having a 180° phase-shift with respect to the output signal received from said first mixing circuit, respectively.

4,908,859

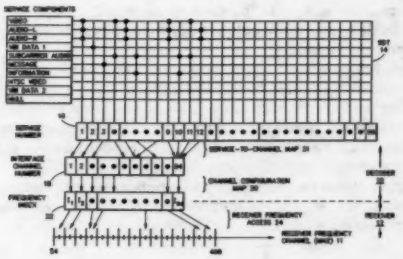
RECEIVER ACCESS INTERFACE TO SERVICE COMPONENTS IN TELEVISION CHANNEL

Christopher J. Bennett, San Diego; James M. Hobza, Carlsbad; Ron D. Katznelson, San Diego, and Gordon K. Walker, Carlsbad, all of Calif., assignors to M/A-COM Government Systems, Inc. and Cable/Home Communication Corp., both of San Diego, Calif.

Continuation-in-part of Ser. No. 909,509, Sep. 19, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,167

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—10 **15 Claims**



1. A receiver interface system for enabling an operator to access different services in a like manner, wherein some of the different services contain different types of combinations of one or more service components received by a receiver in different portions of one or more different frequency channels, comprising

a plurality of separate interface channels for carrying different services containing different combinations of the service components;

switching means for selecting a said service, wherein the switching means is coupled to the interface channels for accessing the respective interface channels in a like manner; and

a decoder coupled to the receiver and the interface channels for accessing the components of said selected service received by the receiver in different portions of one or more different frequency channels to provide said selected service on the interface channel carrying the selected service, wherein the decoder includes

a service definition table defining access to different combinations of the service components by each of a plurality of the separate interface channels, including access to different types of combinations of the service components by some of the separate interface channels, to thereby define access to different services by the separate interface channels; and

a channel configuration map defining access to the frequency channels by the separate interface channels for enabling the different combinations of service components for each of the services to be accessed in accordance with the service definition table.

4,908,860

SYSTEM FOR THE SECRET TRANSMISSION OF AUDIO SIGNALS AND TELEVISION RECEIVER FOR RECEIVING SUCH SIGNALS

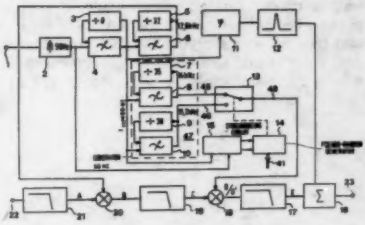
Vincent Caprarese; Thierry Chretien, both of Suresnes, and Richard Dauvillier, Nanterre, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,296

Claims priority, application France, Apr. 19, 1985, 85 05951

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—19 **7 Claims**



1. An encoding arrangement for the secret transmission of television audio signals comprising in a cascade arrangement from an input terminal:

a first filter,

a first modulator coupled to a first fixed-frequency modulation signal generator,

a second filter,

a second modulator coupled via a first change-over switch to out outputs of a first dual-frequency modulation signal generator supplying at these two outputs two modulation signals having two different frequencies, said change-over switch being controlled by a first pseudo-random generator for selecting one or the other of these two modulation signals and

a third filter, characterized in that the first dual frequency modulation signal generator supplying two signals comprises two phase-locked loop oscillators each comprising a frequency divider in the loop and both being controlled by the same reference signal generator, in that this reference signal generator itself comprises an oscillator controlled by the field synchronizing signal of the television transmitter, and in that this signal as well as the reference signal are applied to a synchronizing circuit of the first pseudo-random generator for controlling the instants of change of the modulation signal.

4,908,861

DATA AUTHENTICATION USING MODIFICATION DETECTION CODES BASED ON A PUBLIC ONE WAY ENCRYPTION FUNCTION

Bruno O. Brachtl, Baden-Wuerttenberg, Fed. Rep. of Germany; Don Coppersmith, Ossining, N.Y.; Myrna M. Hyden; Stephen M. Matyas, Jr., both of Manassas, Va.; Carl H. W. Meyer, Kingston, N.Y.; Jonathan Oseas, Hurley, N.Y.; Shaiy Pilpel, Ossining, N.Y., and Michael Schilling, Baden Wuerttemberg, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1987, Ser. No. 90,633

Int. Cl.[4] H04K *1/00*

U.S. Cl. 380—25 **21 Claims**

1. A method for generating a 2N-bit modification detection code which characterizes a data set consisting of a plurality of N bit blocks of data, comprising the steps of:

copying a first one of said data blocks into a first N bit copy and a second N bit copy during a first cycle;

applying said first N bit copy as the data input to a first one way encryption engine, said encryption engine having a

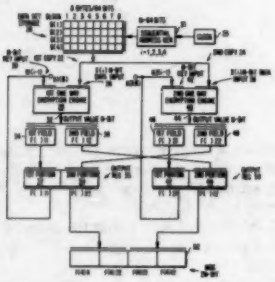
key input with a first initial N bit key and said first encryption engine producing an N bit output value during said first cycle;

storing a first field of said first output value in a first output register and storing a second field of said first output value in a second output register during said first cycle;

applying said second N bit copy to the data input of a second one way encryption engine, having a second N bit key applied thereto and outputting a second N bit output value during said first cycle;

storing a first field of said second N bit output in a first field of said second output register and applying a second field of said second N bit output into a second field of said first output register during said first cycle;

copying a second one of said plurality of N bit blocks from said data set and applying the first copy thereof to said data input of said first one way encryption engine during a next cycle and applying said value stored in said first



output register as the N bit key to said first key input of said first one way encryption engine, and applying said second copy thereof to said data input of said second encryption engine during said next cycle and applying said value stored in said second output register as the N bit key to said second key input of said second encryption engine, to thereby produce a next first result value in said first output register and a next second result value in said second output register;

continuing the operation for all of said plurality of data blocks in said data set until a last first result value is stored in said first output register and a last second result value is stored i said second output register corresponding to the last one of said plurality of data blocks in said data sets;

combining said last first result value from said first output register and said last second result value from said second output register as a 2N-bit modification detection code which characterizes said data set.

4,908,862

ENCODING SYSTEM CAPABLE OF ACCOMPLISHING A HIGH EFFICIENCY BY ANTERIOR AND/OR POSTERIOR PROCESSING TO QUANTIZATION

Masahide Kaneko; Atsushi Koike; Mutsumi Ohta, all of Tokyo; Kiichi Matsuda; Naoki Mukawa, both of Kanagawa, and Yoichi Kato, Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd.; NEC Corporation; Fujitsu Ltd. and Nippon Telegraph and Telephone Corporation, all of, Japan

Filed Nov. 10, 1987, Ser. No. 118,923

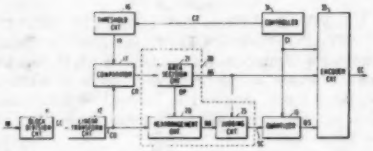
Claims priority, application Japan, Nov. 10, 1986, 61-267338; Nov. 10, 1986, 61-267339

Int. Cl.[4] H04N *7/12, 1/419*

U.S. Cl. 380—28 **10 Claims**

1. In an encoding system for use in encoding a sequence of digital signals into a sequence of encoded signals, said digital signal sequence being subjected to a predetermined linear transform into a sequence of coefficients which is divided into a sequence of blocks and which is produced as a sequence of coefficient signals, said encoding system comprising anterior processing means responsive to said coefficient signal sequence for processing said coefficients in the respective blocks into a sequence of preliminary processed signals, quantizing means coupled to said anterior processing means for quantizing said preliminary processed signals into a sequence of quantized signals, and posterior processing means for processing said quantized signal sequence into said encoded signal sequence, the improvement wherein said anterior processing means comprises:

threshold means for producing a threshold signal representative of a threshold level defined for said coefficients;



comparing means responsive to said threshold signal and said coefficient signal sequence for successively comparing said coefficients with said threshold level in the respective blocks to produce a sequence of comparison result signals representative of results of comparison in the respective blocks;

classifying means responsive to said comparison result signal sequence and said coefficient signal sequence for classifying said coefficients of each block with reference to said results of comparison into first and second species of significant coefficients which are to produce a sequence of significant coefficient signals; and

supply means for supplying said significant coefficient signal sequence to said quantizing means as said preliminary processed signals.

4,908,863

MULTI-PULSE CODING SYSTEM

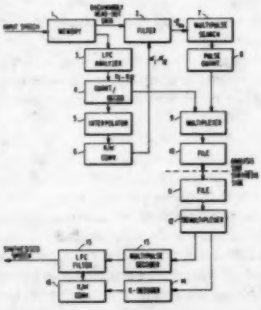
Tetsu Taguchi, and Shigeji Ikeda, both of Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,327

Claims priority, application Japan, Jul. 30, 1986, 61-180363

Int. Cl.[4] G10L *3/02*

U.S. Cl. 381—36 **9 Claims**



1. A multi-pulse coding system comprising:

memory means for storing a digital speech signal sampled at a predetermined sampling interval;

analysis means for developing an LPC (linear predictive coefficient) coefficient by analyzing said speech signal;

a recursive filter having a coefficient specified by said LPC coefficient;

supply means for backwardly supplying the speech signal read out from said memory means in the reverse order to the sampling order of said speech signal to said recursive filter to produce crosscorrelation coefficients between said speech signal and an impulse response of said recursive filter; and

multi-pulse determining means for determining a predetermined number of multi-pulses on the basis of said produced crosscorrelation coefficients.

4,908,864

VOICE RECOGNITION METHOD AND APPARATUS BY UPDATING REFERENCE PATTERNS

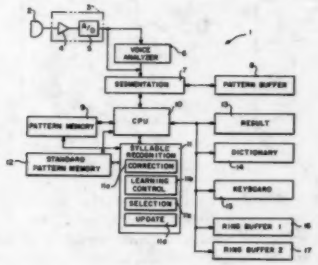
Fumio Togawa; Mitsuhiro Hakaridani; Hiroyuki Iwahashi, and Toru Ueda, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1987, Ser. No. 34,060

Claims priority, application Japan, Apr. 5, 1986, 61-78821; Apr. 5, 1986, 61-78822; Apr. 5, 1986, 61-78823

Int. Cl.[4] G10L *5/06*

U.S. Cl. 381—43 **6 Claims**



5. A voice recognition apparatus for receiving an input voice signal and outputting a syllable array corresponding thereto, said apparatus comprising

memory means for storing standard patterns associated with syllables together with phonological environmental information,

analyzing means for extracting patterns from an input voice signal and tentatively identifying each of said extracted patterns as representing a syllable by calculating similarity levels of said each extracted pattern with a plurality of standard patterns currently stored in said memory means,

input means for assigning a selected new syllable to each pattern determined to have been incorrectly identified by said analyzing means, the remaining ones of said extracted patterns being considered as correctly identified patterns,

a first buffer storing temporal sequences, each corresponding to a syllable and showing the order in which said correctly and incorrectly identified patterns associated with said corresponding syllable have been identified,

a second buffer storing the temporal sequence in which all of said correctly and incorrectly identified patterns have been identified, and

a control unit which serves to reference the contents of said first and second buffers, when a new voice signal with new patterns is received, to obtain therefrom a recent recognition record of each syllable backward in time from when said new voice signal is received and to determine according to said recognition record whether or not one or more of said standard patterns is to be updated by one or more of said new patterns.

4,908,865

SPEAKER INDEPENDENT SPEECH RECOGNITION METHOD AND SYSTEM

George R. Doddington, Richardson, Tex., and Enrico Bocchieri, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

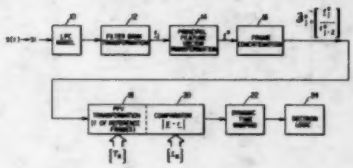
Continuation of Ser. No. 224,224, Jul. 22, 1988, abandoned, which is a continuation of Ser. No. 687,103, Dec. 27, 1984, abandoned. This application Dec. 22, 1988, Ser. No. 290,816

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—43 **10 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 23 Pages)



1. A method of recognizing input speech signals organized into a sequence of frames comprising:

storing a plurality of reference frames of reference feature vectors representing reference words;

generating a spectral feature vector for each frame of said speech signals;

concatenating said spectral feature vectors of adjacent frames to form frame-pair feature vectors;

transforming said frame-pair feature vectors so that the covariance matrix of said transformed frame-pair feature vectors is an identity matrix;

computing the likelihood that each transformed frame-pair feature vector was produced by each said reference frame, said computation performed individually and independently for each said reference frame;

constructing an optimum time path through said input speech signals as represented by the frame-pair feature vectors for each of said computed likelihoods; and

recognizing said input speech signals as one of said reference words in response to said computed likelihoods and said optimum time paths.

4,908,866

SPEECH TRANSCRIBING SYSTEM

Eric Goldwasser, and Dorothy Goldwasser, both of 993 Barberry Rd., Yorktown Heights, N.Y. 10598

Filed Feb. 4, 1985, Ser. No. 697,965

Int. Cl.[4] G10L *7/08, 3/02*

U.S. Cl. 381—44 **8 Claims**

1. In combination, apparatus for the convenient transcription of speech, said apparatus comprising:

a first transducer for generating an electrical signal in response to speech consisting of words or groups of words spoken by a first individual and intervening periods of silence;

means for continuously storing said electrical signal and for simultaneously reproducing a continuous segment of signal having been stored previously;

means for disabling said means for storing and reproducing from storing said signal during said periods of silence, whereby only signal responsive to said spoken words is stored;

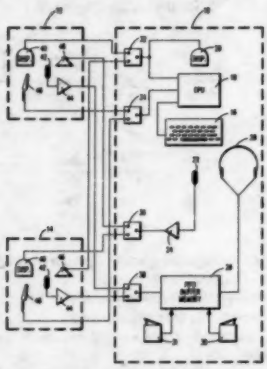
a second transducer connected to said means for storing and reproducing said signal, for reproducing said words, so as to be audible by a second individual;

means for controlling said means for storing and reproducing, such that said means for storing and reproducing is controlled to store signal corresponding to words spoken

by said first individual and simultaneously provide previously stored signal to said second transducer for reproducing words previously spoken to said second individual, and wherein the signal being reproduced at any given time corresponding to the previously stored signal is delayed with respect to the time at which the corresponding signal was stored by a variable delay period;

means operable by said second individual for providing a delay control signal to said means for controlling said means for storing and reproducing; and

a first video display device;



a keyboard device for accepting keystroke inputs from the second individual, and for displaying text corresponding thereto on said first display device, and for accepting further keystroke inputs from the second individual for editing said displayed text; and

a second video display device for displaying the edited text to the first individual;

wherein said means for controlling said means for storing and reproducing varies the delay period responsive to said delay control signal.

4,908,867

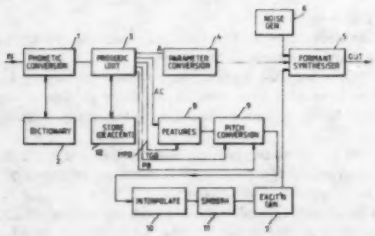
SPEECH SYNTHESIS

Kim E. A. Silverman, Murray Hill, N.J., assignor to British Telecommunications public limited company, United Kingdom

Filed Nov. 19, 1987, Ser. No. 122,804

Int. Cl.[4] G10L *5/02*

U.S. Cl. 381—51 **13 Claims**



1. A speech synthesiser comprising:

(a) means for deriving, from coded text input thereto, phonetic data indicative of the properties of a synthesis filter and accent data indicating the occurrence of accents on words and to identify phrase groups of words delimited by punctuation marks;

(b) means for deriving from the accent data a pitch contour;

(c) an excitation generator responsive to the pitch contour to produce an excitation signal of varying pitch; and

(d) filter means responsive to the phonetic data to filter the excitation signal to produce synthetic speech; wherein each phrase group comprises one or more subgroups and the deriving means are arranged in operation in response to paragraph division within the text to produce a pitch contour which, for a given textual content, is, for each of a plurality of subgroups at the commencement of a paragraph, higher than for a subgroup at an intermediate part of a paragraph by a factor which, falls from a value greater than unity at the commencement of the paragraph to a value of unity at said intermediate part, the factor falling stepwise at the boundary between each one of said plurality of subgroups, and the subgroup which follows it.

4,908,868

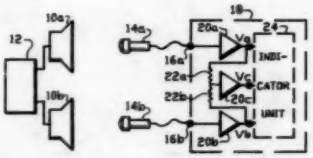
PHASE POLARITY TEST INSTRUMENT AND METHOD

James E. McTaggart, 21470 Rambla Vista, Malibu, Calif. 90265

Filed Feb. 21, 1989, Ser. No. 312,447

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—59 **19 Claims**



1. A phase polarity test instrument, for determining and indicating relative phase polarity between a first alternating signal and a related second alternating signal, comprising:

a first electronic buffering circuit adapted to provide, at an output thereof, a first buffered signal representing said first alternating signal;

a second electronic buffering circuit adapted to provide, at an output thereof, a second buffered signal representing said second alternating signal;

an electronic summing circuit, receiving as inputs said first and second buffered signals, and providing as output a sum signal having instantaneous amplitude equal to the algebraic sum of the instantaneous amplitudes of said first and second buffered signals; and

indicating means, receiving as input said first and second buffered signals and said sum signal, adapted to provide (a) an "in-phase" indication whenever said sum signal exceeds each of said buffered signals in amplitude by a predetermined margin, and (b) an "out-of-phase" indication, distinguishable from said "in-phase" indication, whenever either of said buffered signals exceeds said sum signal in amplitude by a predetermined margin.

4,908,869

INDUCTION-BASED ASSISTIVE LISTENING SYSTEM

Norman Lederman, 4 Collins Rd., Yarmouth, Me. 04096

Filed May 9, 1989, Ser. No. 349,515

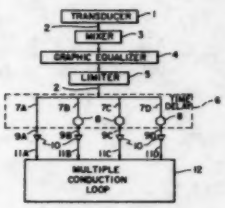
Int. Cl.[4] H04B *5/00*

U.S. Cl. 381—79 **13 Claims**

1. A system for addressing hearing-impaired persons within a targeted audience by the generation of specifically configured audio-frequency magnetic field at pickup coils worn by said hearing-impaired persons comprising:

(a) transducer means for converting an acoustic signal into an electrical voltage signal possessing substantially the same Fourier spectrum as said acoustic signal;

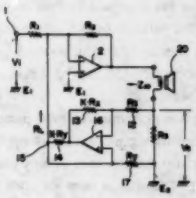
(b) means for dividing said electrical voltage signal into a multiplicity of identical electric voltage signals;
(c) time delay means for introducing various discrete delay times into each of said multiplicity of identical electric voltage signals so as to produce a multiplicity of delayed electrical voltage signals;
(d) means to amplify each of said delayed electrical voltage signals;
(e) a grid of electrical conductors embedded in a flexible mat wherein said mat comprises:
(i) a bottom layer of flexible material;
(ii) a top layer of flexible material;
(iii) means for fastening said top layer over said bottom layer so as to sandwich said grid between said top layer and said bottom layer.
and said grid comprises a planar arrangement of least one pair of electrically isolated conduction loops, each of said conduction loops further comprising an electrically-linked plurality of substantially uniform, substantially rectangular sub-loops, each rectangular sub-loop having a length



dimension equal to approximately four times its width dimension and further where all of said sub-loops of one member of a given pair of said conduction loops are arrayed so as to have their long sides parallel to the long sides of all of said sub-loops of the other member of said pair and are further arranged so that each of said sub-loops of one member of said pair is displaced along its width dimension by a distance equal to one-half the magnitude of said width dimension from the nearest sub-loop belonging to the other member of said pair of electrical conductors; and
(e) means for connecting each of said time-delayed electrical voltage signals to a single one of said conduction loops so as to generate a single current in said single one of said conduction loops such that the current variation produces the same waveform which was associated with said acoustic waveform and where current amplitude produces an audio-frequency magnetic field amplitude of approximately 100 ma/meter at an elevation of 0.5 meters above said mat.

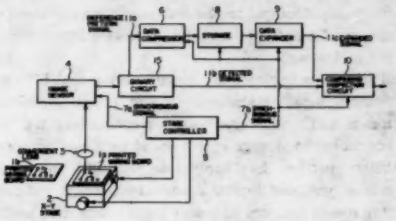
4,908,870
MOTIONAL LOAD DRIVER
Katsuo Nagi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Sep. 26, 1988, Ser. No. 249,383
Claims priority, application Japan, Sep. 30, 1987, 62-247714
Int. Cl.[4] H04R 3/00
U.S. Cl. 381—96 **8 Claims**

1. A motional load driver for driving a motional load having a motional impedance, comprising:
an amplifying section for amplifying an input signal and supplying the thus amplified input signal to said motional load;
a current detecting section for generating an output voltage signal corresponding to a current flowing through said motional load; and
a load impedance cancelation generating section for generating a current corresponding to a magnitude of the output voltage signal generated by said current detecting section and feeding back the current to said amplifying section, said load impedance cancelation current generation section comprising a voltage/current converter for converting the voltage signal into a corresponding current, said voltage/current converter comprising an amplifier having inverting and non-inverting input terminals, a first input resistor one terminal of which is connected to said inverting input terminal, a second input resistor one terminal of which is connected to said non-inverting input terminal, a



feedback resistor connected between said inverting input terminal and an output of said amplifier, and an output resistor one terminal of which is connected to said output of said amplifier and the other terminal of which is connected to an output of said voltage/current converter and said non-inverting input terminal of said amplifier, the voltage signal corresponding to the current flowing through said motional load being applied between the other terminal of said first input resistor and the other terminal of said second input resistor.

4,908,871
PATTERN INSPECTION SYSTEM
Yasuhiko Hara, Machida; Hideaki Doi, Yokohama; Koichi Karasaki, Hadano, and Akira Sase, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 20, 1987, Ser. No. 40,128
Claims priority, application Japan, Apr. 21, 1986, 61-89892
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—8 **9 Claims**



1. A printed wiring board circuit-pattern inspection system comprising:
a two-dimensional movable table for mounting thereon a reference printed circuit board and a test printed circuit board to be inspected one after another;
image pickup means for picking up an image of a circuit board mounted on said movable table, while moving said table so that said image pickup means two-dimensionally scans a predetermined area of said circuit board and for producing a video signal representing the image of the predetermined area of said circuit board;
binary pixel forming means for transforming the video signal

produced by said image pickup means into first binary pattern data;

data processing means for compressing first binary pattern data of the reference printed circuit board, storing compressed first pattern data and selectively reading out and expanding the compressed first pattern data thereby producing second binary pattern data which is substantially identical to the first binary pattern data of the reference printed circuit board;

comparing means for comparing first binary pattern data of the test printed circuit board generated by said binary pixel forming means with the second binary pattern data of the reference printed board produced by said data processing means; and

means including a synchronous signal generator for generating a synchronous signal which is applied to said table, said image pickup means, said binary pixel forming means and said data processing means for controlling operational timing thereof such that said second binary pattern data of the reference printed circuit board produced by said data processing means and said first binary pattern data of the test printed circuit board produced by said binary pixel forming means are applied to said comparing means at the same time wherein said data processing means comprises at least two parallel processing sections, each section including

first buffer memory means having first input/output means and second input/output means for storing said first binary pattern data supplied to said first input/output means from said binary pixel forming means and outputting stored first binary pattern data from said second input/output means and for storing data applied to said second input/output means and outputting stored data from said first input/output means,

compressing-expanding means having third input/output means connected to said second input/output means and fourth input/output means connected to fifth input/output means of second buffer means for compressing said first binary pattern data applied to said third input/output means, outputting compressed pattern data from said fourth input/output means, expanding data applied to said fourth input/output means and outputting expanded data, as second binary pattern data, from said third input/output means, and

said second buffer memory means having said fifth input/output means connected to said fourth input/output means and sixth input/output means connected means connected to storage means for storing said compressed binary pattern data applied to said fifth input/output means from said fourth input/output means and outputting stored compressed binary pattern data from said sixth input/output means;

switching means for applying said binary pattern data part-by-part to said two sections alternately so that said binary pattern data is processed part-by-part parallelly and alternately by said two sections; and

storage means connected through said switching means to said sixth input/output means of said second buffer memory means of said two sections for storing compressed binary pattern data received from said sixth input/output means of any one of said two sections and supplying stored compressed binary pattern data under control of said synchronous signal to said sixth input/output means of any one of said two sections.

4,908,872

METHOD AND APPARATUS FOR EXTRACTING PATTERN CONTOURS IN IMAGE PROCESSING

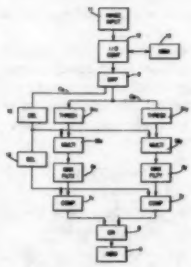
Takashi Toriu, and Hiromichi Iwase, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 5, 1988, Ser. No. 153,426

Claims priority, application Japan, Feb. 6, 1987, 62-25711; Jun. 18, 1987, 62-152001

Int. Cl.[4] G06K 9/48

U.S. Cl. 382—22 8 Claims



1. A method of extracting pattern contours from an image formed by a plurality of pixels arranged in x and y coordinates, each pixel having a gray level graident, said method comprising the steps of:

(a) calculating and outputting a magnitude and direction of the gray level gradient of each pixel among the plurality of pixels;

(b) discriminating the direction of the gray level gradient from within predetermined ranges, and outputting the magnitude of the discriminated gray level gradient for a first group among the plurality of pixels, the discriminated direction of the gray level gradient being within a specified angle range relative to the X-axis and outputting a null signal for pixels not within the specified angle range;

(c) discriminating the direction of the gray level gradient from within predetermined ranges, and outputting the magnitude of the discriminated gray level gradient for a second group among the plurality of pixels, the discriminated direction being within a specified angle range relative to the Y-axis and outputting a null signal for pixels not within the specified angle range;

(d) discriminating each pixel from among the first group, a pixel being discriminated when having a magnitude of gray level gradient greater than or equal to the magnitude of gray level gradient of a specified number of adjacent pixels located on both sides of the pixel in the X-direction, outputting a first level logic signal for said discriminated pixel, and outputting a second level logic signal when the pixel is not discriminated;

(e) discriminating each pixel from among the second group, a pixel being discriminated when having a magnitude of gray level gradient greater than or equal to the magnitude of gray level gradient of a specified number of adjacent pixels located on both sides of the pixel in the Y-direction, outputting a first level logic signal for said discriminated pixel, and outputting a second level logic signal when the pixel is not discriminated; and

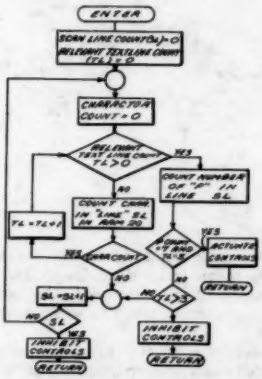
(f) forming the pattern contours by providing a logical sum of the outputted logic signals from said steps (d) and (e).

4,908,873

DOCUMENT REPRODUCTION SECURITY SYSTEM

Alex C. Philibert, 3001 Mockingbird Dr.; Jack W. Smith, 1831 Exeter Dr., and James W. Fox, 172 Andrea Dr., all of Sierra Vista, Ariz. 85635

Filed May 13, 1983, Ser. No. 494,315
Int. Cl.[4] G06K 9/68
U.S. Cl. 382—34 19 Claims



1. A system for selectively effecting operation of a copying apparatus in accordance with the textual content of a scanned document, said copying apparatus including an operation control circuit responsive to control signals applied thereto for actuating said copying apparatus, said system comprising:

optical character reader means, for generating respective scanned character code signals indicative of the respective characters comprising at least a portion of the test of said document;

memory means for storing indicia of at least one correlation criterion in respect of said portion of text; and

processor means, responsive to said scanned character code signals, for selectively generating said control signals to said operation control circuit for enabling or inhibiting said copying apparatus in accordance with a correlation of said criterion with said portion of text.

4,908,874

SYSTEM FOR SPATIALLY TRANSFORMING IMAGES

Steven A. Gabriel, Arvada, Colo., assignor to Ampex Corporation, Redwood City, Calif.

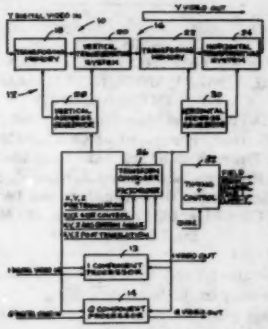
Division of Ser. No. 634,177, Jul. 24, 1984, Pat. No. 4,631,750, which is a continuation of Ser. No. 310,907, Sep. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 139,589, Apr. 11, 1980, abandoned. This application Jan. 6, 1986, Ser. No. 816,176
Int. Cl.[4] G06K 9/32
U.S. Cl. 382—41 12 Claims

1. A system for electronically transforming input data samples corresponding to picture elements of an image, said transformation corresponding to transformation of said picture elements of said image from a source location to a target location in a two dimensional coordinate system in which two coordinates indicate position in respective first and second directions, said system comprising

a first memory coupled to receive a serial sequence of data samples corresponding to source locations serialized by scanning in said first direction, the first memory being selectively operable to output the data samples in the serial sequence in which they are received or in a serial sequence representing scanning in said second direction;

a first filter coupled to receive the data samples output from said first memory and to output a serial sequence of first filtered data samples for target locations in a filtered function of a plurality of the data samples corresponding to picture elements neighboring respective first source location coordinates, said sequence output by said first filter corresponding to scanning in the direction corresponding to the output of said first memory;

a second memory coupled to receive the serial sequence of first filtered data samples from the first filter scanned in the respective said direction and to output the first filtered data samples in scan line data sample sequence representing scanning in the other said direction;



a second filter coupled to receive the first filtered data samples output from said second memory and to output a serial sequence of second filtered data samples scanned in said other direction for target locations as a filtered function of a plurality of the first filtered data samples corresponding to picture elements neighboring second source location coordinates; and

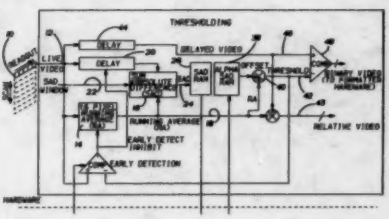
first and second source address generators coupled to provide to the first and second filters serial sequences of respective first and second source addresses corresponding to respective serial sequences of coordinates in accordance with a desired transformation between the source and target locations.

4,908,875

ADAPTIVE THRESHOLDING TECHNIQUE

David Assael, Agoura, and Brian Lincoln, Agoura Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 21, 1989, Ser. No. 326,571
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—52 14 Claims



1. In an image processing system where analog video signals from a detector are converted for further processing, the conversion being a function of a comparison of the analog video signal intensity level relative to a threshold, the analog video

signal being associated with a matrix of pixels arranged in a plurality of rows and columns, the improvement comprising:

means for defining an adaptive threshold level against which the analog video signal level for each pixel position is compared, said means including:

(a) means for calculating a running average of the intensity of the analog video signal; and

(b) means for adding an offset value to the running average, said offset value being a function of a global measure of noise (alpha) in the system and a function of noise specifically associated with the detector (SAD).

4,908,876

APPARATUS AND METHOD FOR ENHANCEMENT OF IMAGE VIEWING BY MODULATED ILLUMINATION OF A TRANSPARENCY

Sherman E. DeForest, Del Mar; Saied Benyamin, Solana Beach; Richard G. Hier, Poway, all of Calif.; Robert A. Kruger; Robert L. Power, both of Salt Lake City, Utah; Gregory W. Schmidt, Olivenhain, and William A. Schmidt, Encinitas, both of Calif., assignors to Digivision, Inc., San Diego, Calif.

Filed Mar. 16, 1988, Ser. No. 169,602

Int. Cl.[4] G06K 9/40

U.S. Cl. 382—54 **10 Claims**

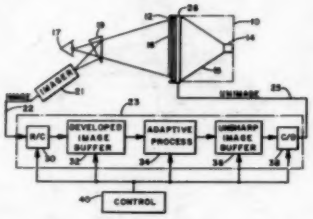
1. An apparatus for enhanced viewing of a developed image on a transparency or the like, comprising:

a first image plane for positioning an image-carrying transparency for visual observation;

an image detector for receiving an image from a transparency at said first image plane and producing an image signal corresponding to said image;

a second image plan in optical alignment with said first image plane;

a light source means positioned with respect to said first and second image planes for projecting viewing light through said first and second image planes;



an image processor connected to said image detector and responsive to said image signal for producing an unsharp representation of said developed image and an unsharp image signal corresponding to said unsharp representation; and

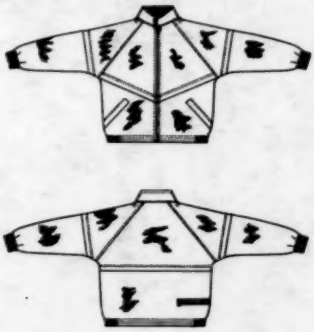
a light modulator connected to said image processor and responsive to said unsharp image signal for generating at said second image plane a pattern of attenuation corresponding to said unsharp image.

DESIGNS

MARCH 13, 1990

306,510
PRIVACY BLANKET FOR A NURSING MOTHER
Maureen A. Sanchez, 1244 Baron Rd., Colorado Springs, Colo. 80920
Filed Mar. 3, 1989, Ser. No. 318,198
Term of patent 14 years
U.S. Cl. D2—179

306,511
SPORTS JACKET
George H. Jones, 13460 S.W. Fielding Rd., Lake Oswego, Oreg. 97034
Filed Jun. 8, 1987, Ser. No. 59,468
Term of patent 14 years
U.S. Cl. D2—191

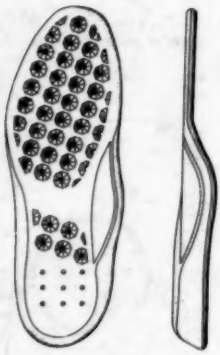


306,512
COMBINED SUN VISOR CAP AND GLASSES
Keith C. Thomas, 212 S. Kraemer Ave., #2304, Placentia, Calif. 92670, and Raymond F. Potter, 7161 Yucca St., Buena Park, Calif. 90621
Filed Dec. 22, 1986, Ser. No. 944,611
Term of patent 14 years
U.S. Cl. D2—246

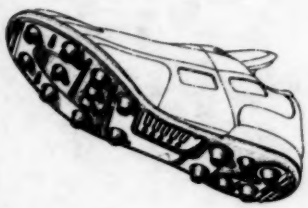
306,513
SNEAKER
Michael A. Sachs, 310 Myrtle St., Winnetka, Ill. 60093, and Howard E. Males, 1642 E. 56th St., Chicago, Ill. 60637
Filed May 21, 1987, Ser. No. 53,415
Term of patent 14 years
U.S. Cl. D2—310

306,514
SHOE UPPER
Peter P. Backus, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Jun. 22, 1989, Ser. No. 370,005
Term of patent 14 years
U.S. Cl. D2—314

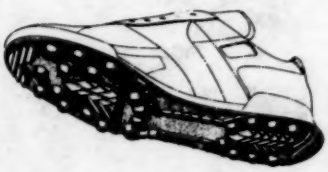
306,515
SHOE PAD
Kun H. Chang, No. 10-3, Ciesu Ciesutsuen, Togio Hsiang Maio Li Shian, Taiwan
Filed Feb. 11, 1987, Ser. No. 13,711
Term of patent 14 years
U.S. Cl. D2—318



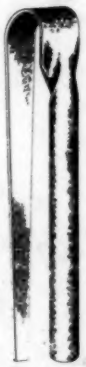
306,516
CLEATED SOLE FOR A SPORT SHOE
Ian H. Whatley, Nashville, Tenn., assignor to Genesco Inc., Nashville, Tenn.
Filed Feb. 11, 1988, Ser. No. 155,013
Term of patent 14 years
U.S. Cl. D2—320



306,517
CLEATED SOLE FOR A SPORT SHOE
Ian H. Whatley, Nashville, Tenn., assignor to Genesco Inc., Nashville, Tenn.
Filed Feb. 11, 1988, Ser. No. 155,014
Term of patent 14 years
U.S. Cl. D2—320

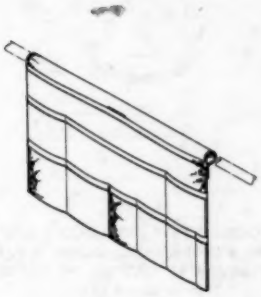


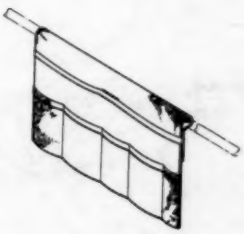
306,518
CYLINDRICAL NECKTIE
Robert E. Cluff, 256 S. Hobson, Mesa, Ariz. 85204
Filed Apr. 21, 1987, Ser. No. 40,624
Term of patent 14 years
U.S. Cl. D2—605



306,519
WRITING CASE
Toshiaki Nakata, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Oct. 31, 1986, Ser. No. 926,231
Claims priority, application Japan, May 30, 1986, 61-20813
Term of patent 14 years
U.S. Cl. D3—74

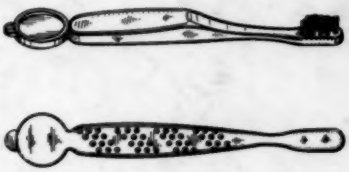
306,520
WHEEL CHAIR ATTACHMENT CONTAINER OR SIMILAR ARTICLE
Patricia McCarthy, 223 N. Sixth St., Apt. #1, Vincennes, Ind. 47591
Filed Aug. 4, 1986, Ser. No. 892,411
Term of patent 14 years
U.S. Cl. D3—40



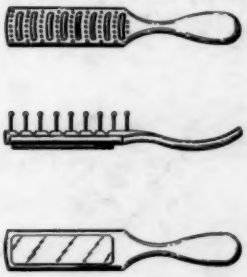


306,521
BELT CLIP HOLDER
Dean Kenney, 737 S. Billings Blvd., Number Zero, Billings, Mont. 59101
Filed Sep. 22, 1986, Ser. No. 910,435
Term of patent 14 years
U.S. Cl. D3—100

306,522
TOOTHBRUSH
Wolfgang Stiller, Ingolstadter Strasse 61 k, Munich 46, Fed. Rep. of Germany
Filed Mar. 31, 1987, Ser. No. 33,163
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 16845
Term of patent 14 years
U.S. Cl. D4—104

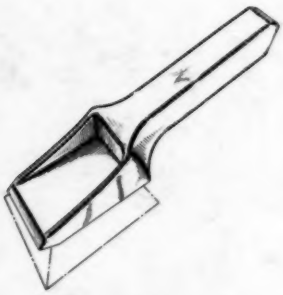


306,523
COMBINED BRUSH AND MIRROR
Gordon J. Natali, and Susan D. Natali, both of Box 84, Webster, Pa. 15087
Filed Sep. 16, 1987, Ser. No. 97,079
Term of patent 14 years
U.S. Cl. D4—116

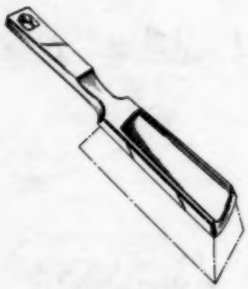


306,524
HAND HELD ROLLER
Rosemary Marshall, 31 Millewa Avenue, Chadstone 3148, Victoria, Australia
Filed Apr. 22, 1987, Ser. No. 41,344
Term of patent 14 years
U.S. Cl. D4—122

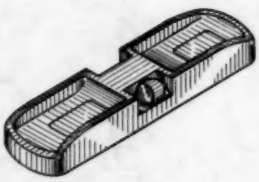
306,525
UTILITY BRUSH HANDLE
Jolyon Saunders, Auckland, New Zealand, assignor to Libman Broom Company, Arcola, Ill.
Filed Aug. 19, 1987, Ser. No. 87,235
Term of patent 14 years
U.S. Cl. D4—138



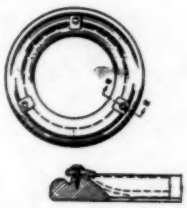
306,526
DUST BRUSH HANDLE
Jolyon Saunders, Auckland, New Zealand, assignor to Libman Broom Company, Arcola, Ill.
Filed Sep. 21, 1987, Ser. No. 98,670
Term of patent 14 years
U.S. Cl. D4—138



306,527
BRUSH BLOCK
J. Joseph Kelly, III, 8 Bay Path Dr., Boylston, Mass. 01505
Filed Feb. 9, 1988, Ser. No. 154,129
Term of patent 14 years
U.S. Cl. D4—138



306,528
PLATE FRAME
Glenn E. Worley, Neodesha, Kans., assignor to E and L Plus, Inc., Neodesha, Kans.
Filed Feb. 24, 1987, Ser. No. 18,063
Term of patent 14 years
U.S. Cl. D6—309

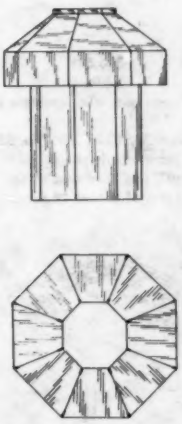


306,529
PHOTOGRAPH OR DOCUMENT HOLDER
John L. Goodell, P.O. Box 39, Jamestown, N.Y. 14702-0039
Filed Aug. 14, 1987, Ser. No. 85,128
Term of patent 14 years
U.S. Cl. D6—310

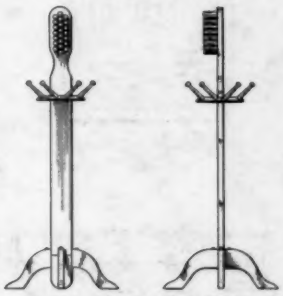
306,530
ROCKING CHAIR
Robert D. Vanderminden, Church St., Granville, N.Y. 12832
Filed Mar. 20, 1987, Ser. No. 28,291
Term of patent 14 years
U.S. Cl. D6—347

306,531
CHAIR
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904
Filed Nov. 4, 1986, Ser. No. 927,303
Term of patent 14 years
U.S. Cl. D6—366

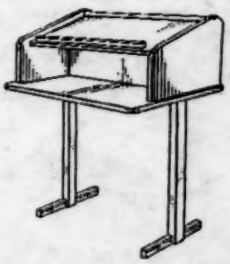
306,532
ADVERTISING DISPLAY STAND
Thomas F. Greyling, 9 Maynardt Van Graan Street, Hennenman, Orange Free State; Jan H. Steenkamp, 343 State Road, Welkom, Orange Free State, and Matthias G. Taute, 18 Phillip Street, Welkom, Orange Free State, all of South Africa
Filed Mar. 9, 1987, Ser. No. 23,469
Claims priority, application South Africa, Sep. 15, 1986, 86/0779
Term of patent 14 years
U.S. Cl. D6—396



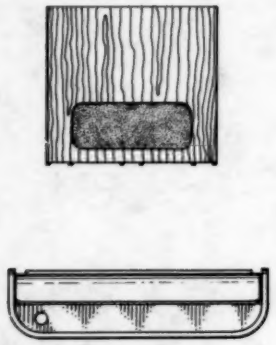
306,533
COAT RACK
Barry R. Fritsch, 7772 Dean Rd., Indianapolis, Ind. 46240
Filed Jun. 15, 1987, Ser. No. 61,574
Term of patent 14 years
U.S. Cl. D6—412



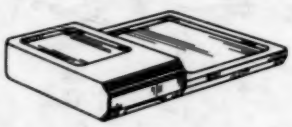
306,534
MULTI-PURPOSE LECTERN
David L. Bacon, 205 S. Higley, No. 212, Mesa, Ariz. 85206, and Catharine P. Crawford, 1308 E. Steamboat Bend, Tempe, Ariz. 85283
Filed Sep. 2, 1986, Ser. No. 903,093
Term of patent 14 years
U.S. Cl. D6—419



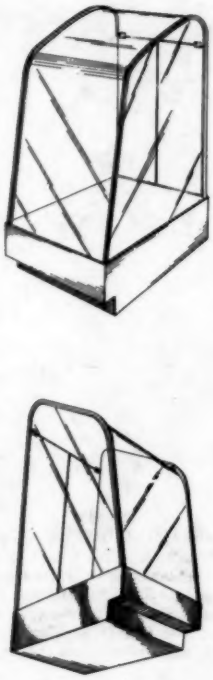
306,535
FOLDABLE LECTERN
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Mar. 27, 1987, Ser. No. 30,903
Term of patent 14 years
U.S. Cl. D6—419



306,536
BASE TRAY FOR AN ESPRESSO MACHINE AND A COFFEE MILL
Alberto Pandolfi, Milan, Italy, assignor to Brevetti Gaggia, S.p.A., Italy
Division of Ser. No. 876,335, Jun. 19, 1986, Pat. No. D. 302,219.
This application Jun. 16, 1989, Ser. No. 367,498
Term of patent 14 years
U.S. Cl. D6—468

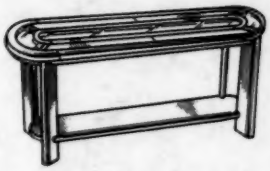


306,537
DISPLAY CASE
David L. Swanson, 1670 Lake Largo, Green Bay, Wis. 54301, and Gilbert Trick, 888 St. Charles, Green Bay, Wis. 54302
Filed Mar. 11, 1987, Ser. No. 24,401
Term of patent 14 years
U.S. Cl. D6—472

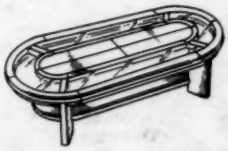


306,538
TABLE
George Mergenov, Longwood, Fla., assignor to Lune-Ching Hu, Paramount, Calif.
Filed Nov. 20, 1986, Ser. No. 933,604
The portion of the term of this patent subsequent to Oct. 24, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—477

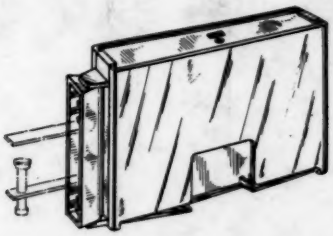
306,539
TABLE
George Mergenov, Longwood, Fla., assignor to Lune-Ching Hu, Paramount, Calif.
Filed Nov. 20, 1986, Ser. No. 933,605
The portion of the term of this patent subsequent to Oct. 24, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—477



306,540
TABLE
George Mergenov, Longwood, Fla., assignor to Lune-Ching Hu, Paramount, Calif.
Filed Nov. 20, 1986, Ser. No. 933,606
The portion of the term of this patent subsequent to Oct. 24, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—477



306,541
PIVOTABLE DISPLAY HOLDER AND DISPENSER FOR SHEET MATERIAL
Richard G. Krautsack, Arlington Heights, Ill., assignor to The Cooperative Marketing Co., Elk Grove Village, Ill.
Filed Mar. 27, 1987, Ser. No. 32,079
Term of patent 14 years
U.S. Cl. D6—515

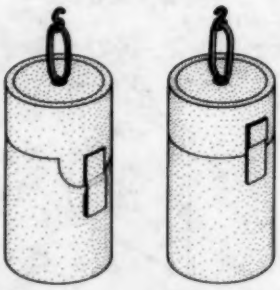


306,542
JEWELRY HOLDER
Phyllis A. Croy, 2744 SE. Mulberry - Vera Cruz, Bluffton, Ind. 46714
Filed May 20, 1987, Ser. No. 51,609
Term of patent 14 years
U.S. Cl. D6—553

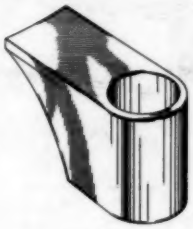
306,543
COMBINATION SEAT AND HANDBAG
Patricia Pestuglicci, 354 Broadway, and Peggy Mosley, 350 Broadway, both of Menands, N.Y. 12204
Filed Nov. 24, 1986, Ser. No. 933,918
Term of patent 14 years
U.S. Cl. D6—601

306,544
HOLDER FOR BEVERAGE CONTAINER
Darryl L. Anderson, 7630 N. Massingale, Tucson, Ariz. 85741
Filed Dec. 7, 1987, Ser. No. 129,680
Term of patent 14 years
U.S. Cl. D7—620

306,545
INSULATOR FOR FLUID CONTAINERS
Tom Roedick, 2700 Hwy. 280 S., Birmingham, Ala. 35223
Filed Jun. 15, 1987, Ser. No. 61,563
Term of patent 14 years
U.S. Cl. D3—608

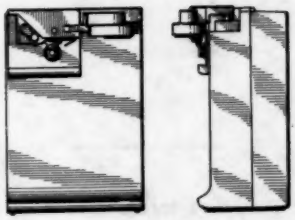


306,546
COMBINED INSULATED BEVERAGE HOLDER AND POUCH
James R. Coy, 750 E. Irvington, Tucson, Ariz. 85706
Filed Sep. 21, 1987, Ser. No. 98,904
Term of patent 14 years
U.S. Cl. D7—605



306,547
COVERED JUG
Anthony H. Wolfenden, Victoria, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed May 23, 1986, Ser. No. 867,869
Claims priority, application Australia, Dec. 24, 1985, 3750/85
Term of patent 14 years
U.S. Cl. D7—317

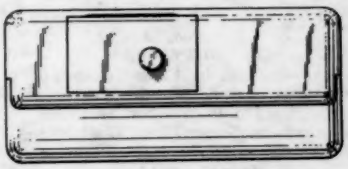
306,548
CAN OPENER
John J. Mezey, Edison, N.J., and Michael Young, Flushing, N.Y., assignors to Robeson Industries Corporation, Mineola, N.Y.
Filed Nov. 23, 1987, Ser. No. 124,465
Term of patent 14 years
U.S. Cl. D8—36



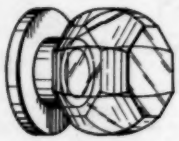
306,549
CORKSCREW
Dennis M. Williams, 64 West Street, Crows Nest, New South Wales, 2065, Australia
Filed Mar. 10, 1987, Ser. No. 24,251
Term of patent 14 years
U.S. Cl. D8—42

306,550
POCKET KNIFE
Michael J. Inman, 11241 Campbell, Riverside, Calif. 92505
Filed Apr. 27, 1987, Ser. No. 43,243
Term of patent 14 years
U.S. Cl. D8—99

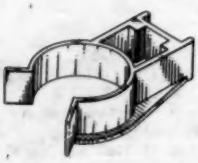
306,551
COMBINED LETTER OPENER WITH PENCIL SHARPENER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Aug. 13, 1987, Ser. No. 85,013
Claims priority, application United Kingdom, May 8, 1987, 1042051
Term of patent 14 years
U.S. Cl. D8—104



306,552
COMBINED KNOB AND ESCUTCHEON
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Division of Ser. No. 879,139, Jun. 26, 1986, Pat. No. D. 298,564.
This application Jun. 6, 1988, Ser. No. 203,349
Term of patent 14 years
U.S. Cl. D8—301



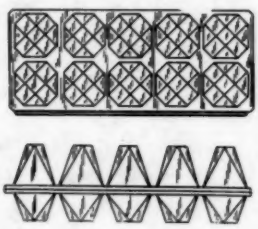
306,553
CHRISTMAS LIGHT CLIP
Donald D. Rumpel, Kellogg, Id., assignor to Kellogg Plastics, Ltd., Smelterville, Id.
Filed Feb. 29, 1988, Ser. No. 161,671
Term of patent 14 years
U.S. Cl. D8—395



306,554
DISPENSER
Thomas J. Lawson, Leicester, England, assignor to The English Glass Company Limited, United Kingdom
Filed Feb. 10, 1987, Ser. No. 13,276
Claims priority, application United Kingdom, Aug. 18, 1986, 1036135
Term of patent 14 years
U.S. Cl. D9—300

306,555
POUCH
William A. Lane, Redlands, and Steven D. Davis, Yucaipa, both of Calif., assignors to W. A. Lane, Inc., San Bernardino, Calif.
Filed Nov. 30, 1987, Ser. No. 126,700
Term of patent 14 years
U.S. Cl. D9—305

306,556
EGG CARTON
Ralph B. Andy, 833 Lockhart St., Washington, Pa. 15301
Filed Aug. 27, 1987, Ser. No. 89,845
Term of patent 14 years
U.S. Cl. D9—341

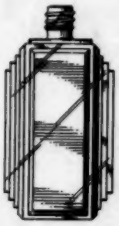


306,557
BOTTLE
Sean C. Peake-Atkins, Toronto, Canada, assignor to Polybottle, Brampton, Canada
Filed Feb. 25, 1987, Ser. No. 18,905
Claims priority, application Canada, Jan. 7, 1987, 07-01-87-6
Term of patent 14 years
U.S. Cl. D9—376

306,558
CALIBRATED CONTAINER
Brook J. Beaston, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.
Filed Sep. 15, 1987, Ser. No. 96,846
Term of patent 14 years
U.S. Cl. D9—378

306,559
COMBINED BOTTLE AND CLOSURE
Philippe Leonard, Neuilly sur Seine, France, assignor to Leonard Parfums, France
Filed Nov. 24, 1987, Ser. No. 124,767
Claims priority, application France, Jul. 15, 1987, 874176
Term of patent 14 years
U.S. Cl. D9—384

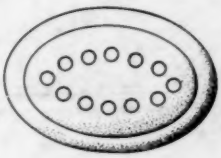
306,560
PERFUME BOTTLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Feb. 12, 1988, Ser. No. 155,622
Term of patent 14 years
U.S. Cl. D9—384



306,561
CLAM SHELL PACKAGE WITH WINGS
Noel Lee, 47 W. Park Dr., Daly City, Calif. 94105
Filed Jun. 15, 1987, Ser. No. 62,826
Term of patent 14 years
U.S. Cl. D9—415

306,562
PACKAGE FOR COSMETICS
Robert A. Barish, Trenton, and Frederick G. Searby, Freehold, both of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.
Filed Feb. 25, 1988, Ser. No. 160,569
Term of patent 14 years
U.S. Cl. D9—424

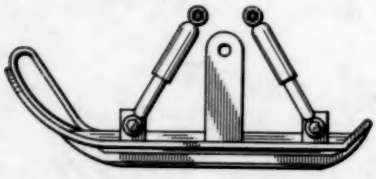
306,563
APPLICATOR FOR ANTIPERSPIRANT
Robert C. Johnson, Okeana, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 15, 1987, Ser. No. 108,866
Term of patent 14 years
U.S. Cl. D9—434



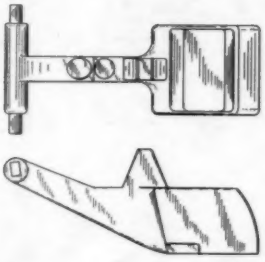
306,564
BOTTLE HOLDER
Matthias M. Goldstein, 3100 Julian Ave., Long Beach, Calif. 90808
Filed Oct. 23, 1987, Ser. No. 112,134
Term of patent 14 years
U.S. Cl. D09—455

306,565
DOOR MOUNTED ADVERTISING DISPLAY CHIME
James P. Pawlik, 5592 Lory Dr., Greendale, Wis. 53129, and Margaret A. Erdall, 225 Fairway Dr., Brookfield, Wis. 53005
Filed Mar. 2, 1987, Ser. No. 20,656
Term of patent 14 years
U.S. Cl. D10—118

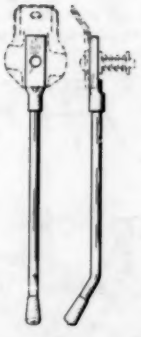
306,566
ALL TERRAIN VEHICLE SKI UNIT
Steve A. Symington, R1, Box 136D, Reche, N. Dak.
Filed Dec. 3, 1987, Ser. No. 128,510
Term of patent 14 years
U.S. Cl. D12—7



306,567
CONNECTOR UNIT FOR CONNECTING TWO BICYCLES SIDE-BY-SIDE
Bruce H. Parker, 26038 Charing Cross Rd., Valencia, Calif. 91355
Filed May 14, 1987, Ser. No. 51,032
Term of patent 14 years
U.S. Cl. D12—114



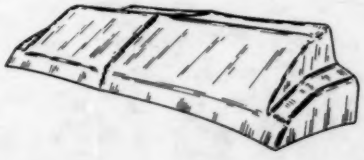
306,568
LEG FOR A BICYCLE KICKSTAND
David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.
Continuation-in-part of Ser. No. 782,506, Oct. 1, 1985, Pat. No. Des. 294,014. This application Jan. 22, 1988, Ser. No. 146,803
The portion of the term of this patent subsequent to Feb. 2, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—120



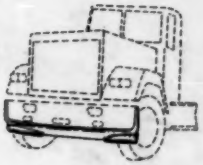
306,569
VEHICLE TOP
David K. Walz, Stone Mountain, and William D. Hodgson, Fayetteville, both of Ga., assignors to Wildfire, Inc., Winder, Ga.
Filed May 21, 1987, Ser. No. 52,363
Term of patent 14 years
U.S. Cl. D12—156

306,570
VEHICLE TOP
Steve Lomonaco, Watkinsville, Ga., assignor to Wildfire, Inc., Winder, Ga.
Filed Jan. 7, 1988, Ser. No. 141,682
Term of patent 14 years
U.S. Cl. D12—156

306,571
COMBINED WIND DEFLECTOR AND ROOF STORAGE CONTAINER
Floyd E. Mount, 105 - 12th Avenue N.W., Waukon,, Iowa 52172
Filed Jul. 23, 1987, Ser. No. 76,741
Term of patent 14 years
U.S. Cl. D12—181

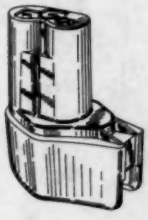


306,572
BUMPER SPOILER
Donald R. Herpel, 29466 Candlewood, Southfield, Mich. 48076
Filed Sep. 28, 1987, Ser. No. 101,545
Term of patent 14 years
U.S. Cl. D12—181



306,573
BATTERY PACK
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed May 11, 1987, Ser. No. 48,125
Term of patent 14 years
U.S. Cl. D13—11

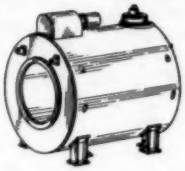
306,574
BATTERY PACK
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed May 29, 1987, Ser. No. 55,757
Term of patent 14 years
U.S. Cl. D13—11



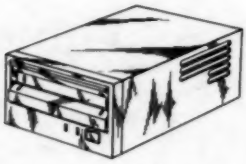
306,575
DISPLAY PANEL FOR AN IRRIGATION CONTROLLER
Andrea Brundisini, Dana Point, Calif., assignor to James Hardie Irrigation, Inc., Laguna Niguel, Calif.
Filed Oct. 21, 1987, Ser. No. 112,140
Term of patent 14 years
U.S. Cl. D13—35

306,576
CIRCUIT MODULE HOUSING
Jeffrey M. Hiatt, Monmouth Beach, N.J.; Chris G. Johnson, New York, N.Y.; William H. Martin, Jr., Holmdel, N.J.; Mark E. Millman, Keyport, N.J., and Timothy P. Wink, Eatontown, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Oct. 30, 1986, Ser. No. 925,121
Term of patent 14 years
U.S. Cl. D13—40

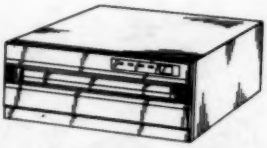
306,577
SUPERCONDUCTING MAGNET FOR MAGNETIC RESONANCE IMAGING APPARATUSES
Kinya Matsutani, Yokohama, and Hirotsugu Ohguma, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 25, 1987, Ser. No. 101,165
Claims priority, application Japan, Mar. 27, 1987, 62-11243
Term of patent 14 years
U.S. Cl. D13—99



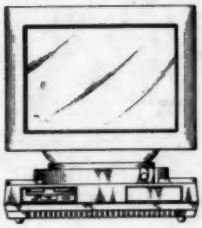
306,578
OPTICAL DISK DRIVE UNIT FOR ELECTRONIC COMPUTER
Sumie Ishikawa, Tachikawa; Kenji Yokoi, Matsudo, and Mamoru Sumita, Minamiashigara, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Jul. 10, 1987, Ser. No. 72,000
Term of patent 14 years
U.S. Cl. D14—109



306,579
OPTICAL DISK UNIT FOR ELECTRONIC COMPUTERS
Kunio Hara, Chiba, and Atsushi Tani, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 7, 1988, Ser. No. 180,261
Claims priority, application Japan, Oct. 9, 1987, 62-41115
Term of patent 14 years
U.S. Cl. D14—109



306,580
COMPUTER TERMINAL
Jeff C. Elsmore; James A. Haager, both of Tempe; John A. Scheibenreif, Phoenix, and Francis Strickett, Mesa, all of Ariz., assignors to IDEA Courier Incorporated, Tempe, Ariz.
Filed Oct. 12, 1987, Ser. No. 108,295
Term of patent 14 years
U.S. Cl. D14—113

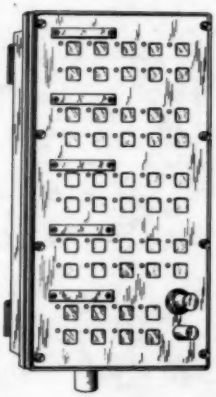


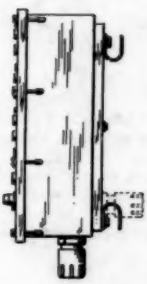
306,581
TELEVISION RECEIVER
Christophel L. Kautz, Maarssen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 24, 1987, Ser. No. 18,142
Claims priority, application United Kingdom, Aug. 27, 1986, 1036344
Term of patent 14 years
U.S. Cl. D14—126

306,582
PORTABLE TELEVISION SET
Akihiro Miyahara, Kunitachi, and Hiroshi Nakatsuka, Kokubunji, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 29, 1987, Ser. No. 79,278
Term of patent 14 years
U.S. Cl. D14—126

306,583
RADIO TRANSCEIVER HOUSING OR SIMILAR ARTICLE
Rudolph W. Krolopp, Barrington Hills, Ill.; Duke Larsen, Lake Geneva, Wis., and Thomas A. Freeburg, Arlington Heights, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 7, 1987, Ser. No. 129,809
Term of patent 14 years
U.S. Cl. D14—137

306,584
SHIPBOARD OPERATIONS TERMINAL USED WITH DIGITIZED VOICE CONTROL-MACHINE AND COMMUNICATION SYSTEM
Serge A. Cavalier, Nice, France, assignor to Safare-Crouzet, France
Filed Aug. 6, 1987, Ser. No. 83,056
Claims priority, application France, Feb. 10, 1987, 87 0648
Term of patent 14 years
U.S. Cl. D14—147



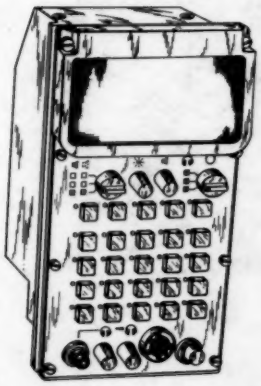


306,585

SHIPBOARD OPERATIONS TERMINAL USED WITH DIGITIZED VOICE CONTROL MACHINE AND COMMUNICATION SYSTEMS

Serge A. Cavalier, Nice, France, assignor to Safare-Crouzet, France

Filed Aug. 6, 1987, Ser. No. 83,057
Claims priority, application France, Feb. 10, 1987, 87 0648
Term of patent 14 years
U.S. Cl. D14—147



306,586

TELEPHONE SUBSET BASE

Vincente D. Vallejo, Malaga, Spain, assignor to Alcatel Standard Electrica S.A., Madrid, Spain

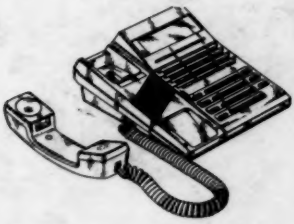
Continuation-in-part of Ser. No. 32,394, Mar. 30, 1987. This application Sep. 20, 1988, Ser. No. 247,101
Claims priority, application Spain, Sep. 30, 1986, 111373
Term of patent 14 years
U.S. Cl. D14—149

306,587

TELEPHONE

Takaharu Ando, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

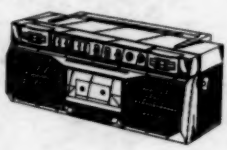
Filed Nov. 30, 1988, Ser. No. 278,259
Claims priority, application Japan, Jun. 1, 1988, 63-21300
Term of patent 14 years
U.S. Cl. D14—151



306,588
COMBINED TAPE RECORDER AND RADIO RECEIVER
Ryoh Kashiwagi, Junitachi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 15, 1987, Ser. No. 108,415
Claims priority, application Japan, Apr. 30, 1987, 62-17047
Term of patent 14 years
U.S. Cl. D14—163

306,589
TAPE RECORDER
Noboru Murayama, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,387
Claims priority, application Japan, Feb. 2, 1987, 62-3766
Term of patent 14 years
U.S. Cl. D14—165

306,590
CASSETTE TAPE RECORDER
Young H. Ham, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 27, 1987, Ser. No. 113,266
Claims priority, application Rep. of Korea, May 6, 1987, 6667/1987
Term of patent 14 years
U.S. Cl. D14—165

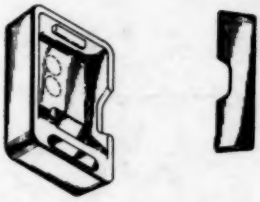


306,591
COMBINED DICTATION UNIT AND TELEPHONE ANSWERING MACHINE
Sandor F. Weisz, Stamford, Conn., and Andrew J. Blance, Mamaroneck, N.Y., assignors to Dictaphone Corporation, Stratford, Conn.
Filed Jan. 15, 1987, Ser. No. 5,532
Term of patent 14 years
U.S. Cl. D14—168

306,592
IN-WALL LOUDSPEAKER
Keld Hansson, Schaumburg, Ill., assignor to Bang & Olufsen of America, Inc., Mt. Prospect, Ill.
Filed Aug. 20, 1987, Ser. No. 87,683
Term of patent 14 years
U.S. Cl. D14—214

306,593
FEED HORN
Nobuhiro Ono, and Hideaki Okada, both of Mie, Japan, assignors to Inax Corporation, Aichi, Japan
Filed Dec. 9, 1986, Ser. No. 939,938
Claims priority, application Japan, Jun. 10, 1986, 61-22301
Term of patent 14 years
U.S. Cl. D14—231

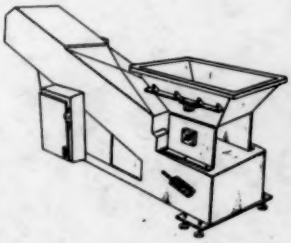
306,594
TELEPHONE HANDSET HANG-UP HOLDER OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 20, 1988, Ser. No. 287,415
Term of patent 14 years
U.S. Cl. D14—253



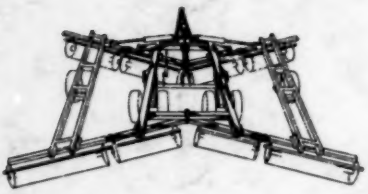
306,595
WINDMILL HUB
John S. Blick, III, 31891 Circle Dr., South Laguna, Calif. 92677
Filed Apr. 27, 1987, Ser. No. 42,875
Term of patent 14 years
U.S. Cl. D15—1

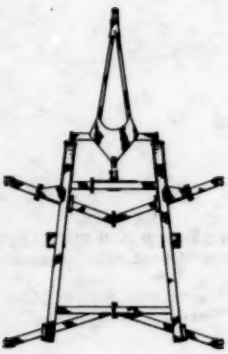
306,596
OFFSET PUMP HOUSING
Robert E. Maddock, 2252 Grand Ave., Phoenix, Ariz. 85009
Filed Feb. 2, 1988, Ser. No. 151,646
Term of patent 14 years
U.S. Cl. D15—7

306,597
CONTINUOUS DRIER FOR BULK MATERIAL
John W. Vanden Bos, Holland, Mich., assignor to JWI, Inc., Holland, Mich.
Filed Sep. 28, 1987, Ser. No. 86,165
Term of patent 14 years
U.S. Cl. D15—10

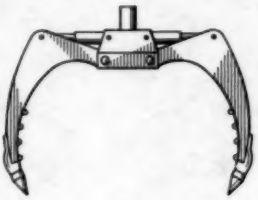


306,598
FRAME FOR A DISK HARROW OR SIMILAR IMPLEMENT
James A. Swartzendruber, West Bend, Wis.; Warren L. Thompson, Ankeny, and Donald R. Peck, Clive, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Jun. 23, 1988, Ser. No. 211,529
Term of patent 14 years
U.S. Cl. D15—11

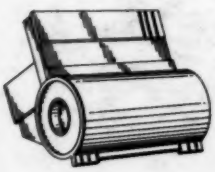




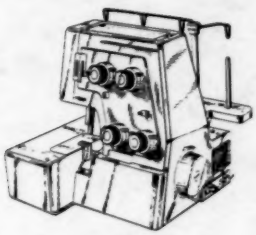
306,599
GRAPPLE WITH REPLACEMENT TIP THEREFOR
Joseph R. Hunter, R.D. #2, Box 121, Honeybrook, Pa. 19344
Filed Sep. 2, 1988, Ser. No. 239,858
Term of patent 14 years
U.S. Cl. D15—32



306,600
PULSE GENERATING MACHINE FOR USE IN TREATING TOOLS
Vladimir Drits, Minnetonka, and Eugene N. Reshanov, Golden Valley, both of Minn., assignors to Innovex Inc., Hopkins, Minn.
Filed May 4, 1987, Ser. No. 46,037
Term of patent 14 years
U.S. Cl. D15—122

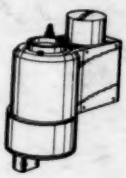


306,601
SEWING MACHINE
Koji Uchida, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Oct. 3, 1986, Ser. No. 915,315
Claims priority, application Japan, Aug. 8, 1986, 61-30859
Term of patent 14 years
U.S. Cl. D15—69



306,602
NOZZLE FOR VEHICLE AIR DRYING APPARATUS
James A. Belanger; Robert J. Wentworth, both of Northville; Graham J. Astley, Novi, and Barry S. Turner, Livonia, all of Mich., assignors to Belanger, Inc., Northville, Mich.
Filed Apr. 1, 1987, Ser. No. 32,653
Term of patent 14 years
U.S. Cl. D15—144.1

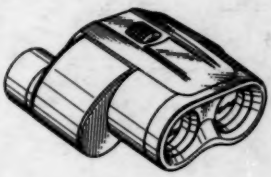
306,603
WELDING SEAM TRACKER
Torbjorn Forss; Hakan Fardig, and Tommy Svensson, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden
Filed Jan. 7, 1987, Ser. No. 1,271
Claims priority, application Sweden, Jul. 7, 1986, 86-1621
Term of patent 14 years
U.S. Cl. D15—199



306,604
EYE WEAR OR SIMILAR ARTICLE
Cecil A. Null, P.O. Box 4, Lightfoot, Va. 23090-0004
Filed Mar. 10, 1986, Ser. No. 24,782
Term of patent 14 years
U.S. Cl. D16—104

306,605
BORESCOPE
Russell Manoy, 32 Oakhill Drive, Welwyn, Herts, England (AL6 9NW), and Henry Greaves, 31 Shaftsbury Road, London, N8, England
Filed Dec. 24, 1987, Ser. No. 138,018
Claims priority, application United Kingdom, Jun. 25, 1987, 1043098
Term of patent 14 years
U.S. Cl. D16—130

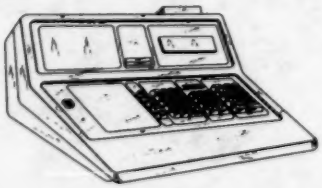
306,606
PAIR OF BINOCULARS
Toshimasa Yamanaka; Takenao Shishikura, and Akio Takahashi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 179,002
Claims priority, application Japan, Oct. 9, 1987, 62-41539
Term of patent 14 years
U.S. Cl. D16—133



306,607
CLOSE-UP CAMERA
Edgar S. Lemmey, 108 Aspen Dr., Woodbury, N.Y. 11797
Filed Apr. 9, 1987, Ser. No. 36,275
Term of patent 14 years
U.S. Cl. D16—209

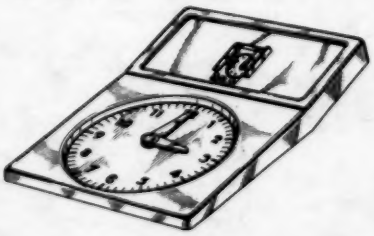
306,608
TAMBOURINE OR SIMILAR ARTICLE
Jeng-Shyong Wang, No. 9-3, Hai-Wei-Tzu Lane, Chang-Yang Rd., Lung Ching Hsiang, Taichung Hsien, Taiwan
Filed Aug. 17, 1988, Ser. No. 233,055
Term of patent 14 years
U.S. Cl. D17—22

306,609
POINT-OF-SALE TERMINAL
Leonardus Koppens, deceased, late of Gravenwezel, Belgium, and Han Maarschalkerweerd, executor, Heerhugowaard, Netherlands, assignors to Schlumberger Industries, Inc., Chesapeake, Va.
Filed Dec. 9, 1986, Ser. No. 939,877
The portion of the term of this patent subsequent to Feb. 11, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—4

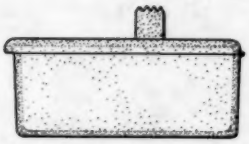


306,610
CONTROLLER FOR LABEL PRINTING AND APPLYING MACHINE
Yo Sato, Tokyo, and Tadao Kashiwaba, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan
Filed Feb. 10, 1986, Ser. No. 828,067
Claims priority, application Japan, Oct. 16, 1985, 60-43044
Term of patent 14 years
U.S. Cl. D18—22

306,611
TEACHING CLOCK
Brian Hills, Rolling Hills Estate; Dennis J. Graham, Long Beach, and Burton Cutler, Rolling Hills, all of Calif., assignors to Educational Insights, Inc., Dominguez Hills, Calif.
Filed Dec. 11, 1986, Ser. No. 941,958
Term of patent 14 years
U.S. Cl. D19—64

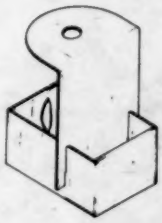


306,612
DISPENSER FOR CHEMICALLY-CODED STRIPS USED IN MEDICAL TREATMENT
William F. Kahler, Johns Island, S.C., assignor to Tek-Aids, Inc., Charleston, S.C.
Filed Mar. 23, 1988, Ser. No. 172,204
Term of patent 14 years
U.S. Cl. D19—67



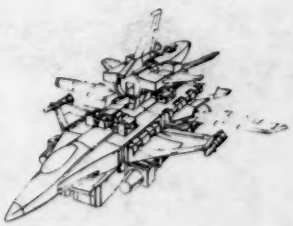
306,613
LUGGAGE TAG
Christopher H. F. Parker, Surrey, England, assignor to Geared for Travel Limited, Surrey, England
Filed Jan. 27, 1987, Ser. No. 7,429
Claims priority, application United Kingdom, Jul. 25, 1986, 1,035,602
Term of patent 14 years
U.S. Cl. D20—27

306,614
DISPLAY HOLDER FOR ATTACHMENT TO BOTTLES OR SIMILAR ARTICLES
Gary A. Kodner, St. Louis, and Kenneth D. Froeschner, Jennings, both of Mo., assignors to Busch Creative Services Corporation, St. Louis, Mo.
Filed Sep. 2, 1986, Ser. No. 903,111
Term of patent 14 years
U.S. Cl. D20—42



306,615
JOYSTICK
Charles L. Hayes, Carlsbad, Calif., assignor to CH Products, San Marcos, Calif.
Filed Sep. 30, 1987, Ser. No. 103,251
Term of patent 14 years
U.S. Cl. D21—48

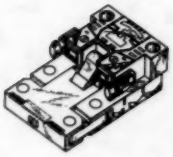
306,616
TOY JET-PLANE
Kouzin Ohno, Chiba, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 4, 1988, Ser. No. 190,225
Claims priority, application Japan, Jan. 13, 1988, 63-1016
Term of patent 14 years
U.S. Cl. D21—87



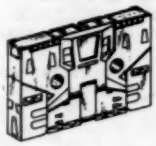
306,617
TOY FIGURE
Martha Monigle, 10900 Temple Ter., #I-717, Seminole, Fla. 34642
Filed Dec. 20, 1988, Ser. No. 287,986
Term of patent 14 years
U.S. Cl. D21—148

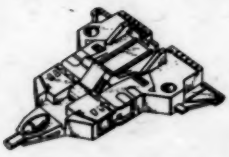
306,618
TOY HUMANOID ROBOT ASSEMBLY
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1988, Ser. No. 163,877
Claims priority, application Japan, Oct. 30, 1987, 62-44721
Term of patent 14 years
U.S. Cl. D21—150

306,619
RECONFIGURABLE TOY CASSETTE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1988, Ser. No. 163,878
Claims priority, application Japan, Oct. 30, 1987, 62-44716
Term of patent 14 years
U.S. Cl. D21—150

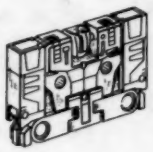


306,620
RECONFIGURABLE TOY CASSETTE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1988, Ser. No. 163,879
Claims priority, application Japan, Oct. 30, 1987, 62-44717
Term of patent 14 years
U.S. Cl. D21—150



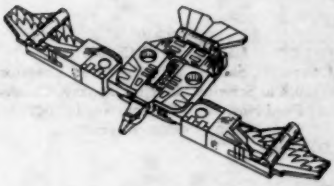


306,621
RECONFIGURABLE TOY CASSETTE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1988, Ser. No. 163,880
Claims priority, application Japan, Oct. 30, 1987, 62-44719
Term of patent 14 years
U.S. Cl. D21—150



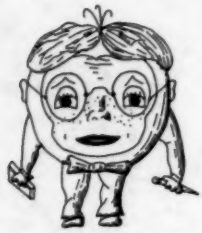
306,622
TOY HUMANOID ROBOT ASSEMBLY
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1988, Ser. No. 163,881
Claims priority, application Japan, Oct. 30, 1987, 62-44720
Term of patent 14 years
U.S. Cl. D21—150

306,623
RECONFIGURABLE TOY CASSETTE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1988, Ser. No. 163,882
Claims priority, application Japan, Oct. 30, 1987, 62-44718
Term of patent 14 years
U.S. Cl. D21—150



306,624
TOY BEAR FIGURE
Edna L. Barnes, 1501 North Tower, Baltimore, Md. 21201, assignor to Edna L. Barnes, Baltimore, Md.
Filed Dec. 2, 1986, Ser. No. 937,142
Term of patent 14 years
U.S. Cl. D21—159

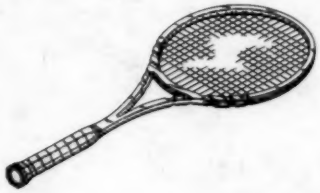
306,625
STUFFED TOY FIGURE
Gwendolyn A. Flust, 526 Hellwig La., West Islip, N.Y. 11795
Filed Dec. 19, 1986, Ser. No. 943,598
Term of patent 14 years
U.S. Cl. D21—171



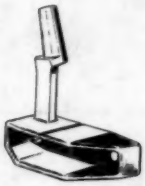
306,626
CYCLE EXERCISER
Eugene J. Szymski, Skokie, and Rene Mraz, Evanston, both of Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.
Filed Nov. 27, 1987, Ser. No. 147,001
Term of patent 14 years
U.S. Cl. D21—194

306,627
REVOLVING GOLF TEE
Jim Fox, 2225 Buchtel Blvd., Ste. 607, Denver, Colo. 80210
Continuation-in-part of Ser. No. 707,815, Mar. 4, 1985. This application Aug. 6, 1987, Ser. No. 82,102
Term of patent 14 years
U.S. Cl. D21—208

306,628
TENNIS RACKET
Kun-Nan Lo, NO.33, Hsiang Ho Rd., Lee Lin Village, Tan Tzu, Taichung, Taiwan
Filed Mar. 17, 1987, Ser. No. 26,552
Term of patent 14 years
U.S. Cl. D21—212



306,629
GOLF PUTTER HEAD
William B. Shearer, 2905 W. Main St., Muncie, Ind. 47305
Filed Feb. 2, 1987, Ser. No. 9,901
Term of patent 14 years
U.S. Cl. D21—219



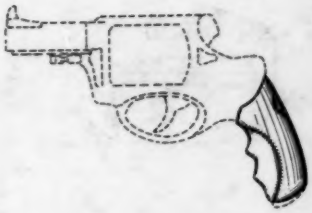
306,630
GOLF PUTTER HEAD
Michael L. Dinte, and Anthony J. Dinte, both of Alexandria, Australia, assignors to J.A. Dinte Pty. Limited, Alexandria, Australia
Filed May 7, 1987, Ser. No. 47,456
Claims priority, application Australia, Feb. 6, 1987, 0362/87
Term of patent 14 years
U.S. Cl. D21—219

306,631
TOWED WATERCRAFT
John J. Aguilar, 1730 Mississippi Blvd., Coon Rapids, Minn. 55433, and Orren Lacht, 1481 W. 240 St., Farmington, Minn. 55024
Filed Apr. 10, 1987, Ser. No. 36,849
Term of patent 14 years
U.S. Cl. D21—228

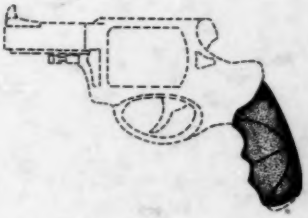
306,632
GOLFING PRACTICE DEVICE
Ronald P. Gouin, West Halifax, Vt., assignor to Bogey-Buster, Inc., Jacksonville, Vt.
Filed Jul. 2, 1987, Ser. No. 69,582
Term of patent 14 years
U.S. Cl. D21—234

306,633
FLOAT
Henry S. Wolfe, 14810 Rue De Bayonne, Apt. 3H, Clearwater, Fla. 33520
Filed Oct. 28, 1986, Ser. No. 924,496
Term of patent 14 years
U.S. Cl. D21—237

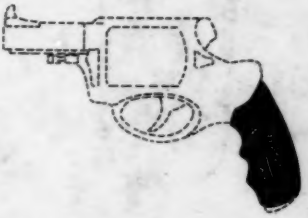
306,634
GUN GRIP
Daniel Cox, 106-19 31st. Ave., East Elmhurst, N.Y. 11369
Filed Feb. 2, 1989, Ser. No. 305,508
Term of patent 14 years
U.S. Cl. D22—104



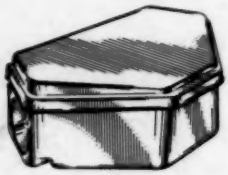
306,635
GUN GRIP
Daniel Cox, 106-19 31st. Ave., East Elmhurst, N.Y. 11369
Filed Feb. 2, 1989, Ser. No. 305,510
Term of patent 14 years
U.S. Cl. D22—104



306,636
GUN GRIP
Daniel Cox, 106-19 31st Ave., East Elmhurst, N.Y. 11369
Filed Feb. 2, 1989, Ser. No. 306,035
Term of patent 14 years
U.S. Cl. D22—104



306,637
RODENT BAIT STATION
Johnie A. Henderson, Apopka, Fla., assignor to Multimethods, Inc., Winter Springs, Fla.
Filed Dec. 10, 1987, Ser. No. 130,970
Term of patent 14 years
U.S. Cl. D22—119

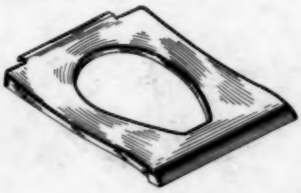


306,638
FISHING POLE
Karl D. Lerch, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 70,888
Term of patent 14 years
U.S. Cl. D22—137

306,639
CONTAINER FOR PRESSURIZED FLUIDS
Anthony J. Wills, Clevedon, England, assignor to BP Co. p.l.c., London, England
Filed Jan. 19, 1988, Ser. No. 145,777
Term of patent 14 years
U.S. Cl. D23—205

306,640
LIQUID FILTER CARTRIDGE FOR SWIMMING POOLS OR THE LIKE
Aaron D. Kott, Massapequa, N.Y., assignor to Pleatco Electronic & Filter Corp., West Babylon, N.Y.
Filed Nov. 6, 1987, Ser. No. 118,336
Term of patent 14 years
U.S. Cl. D23—209

306,641
TOILET SEAT
Herbert V. Kohler, Jr., Kohler, and Mary J. Reid, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 12, 1988, Ser. No. 144,434
Term of patent 14 years
U.S. Cl. D23—311

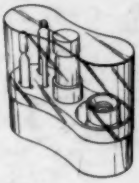


306,642
HOUSING FOR AN OUTDOOR COIL OF AN AIR CONDITIONING SYSTEM
Dick Y. K. Chang, Indianapolis; Keith V. Eisberg, Martinsville, and Curtis D. Wichmann, Indianapolis, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Feb. 29, 1988, Ser. No. 162,381
Term of patent 14 years
U.S. Cl. D23—351

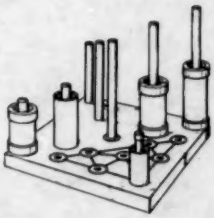
306,643
CEILING FAN BLADE
William N. Taylor, III, 2414 Shady Lake Cir., Carrollton, Tex. 75006
Division of Ser. No. 174,639, Mar. 29, 1988. This application Aug. 14, 1989, Ser. No. 393,466
Term of patent 14 years
U.S. Cl. D23—413

306,644
ELECTRIC FRAGRANCE DISPENSER FOR INSERTION IN AN AUTOMOBILE CIGARETTE LIGHTER SOCKET
Chella Luthy, New York, N.Y., assignor to Creative Environments, Inc., New York, N.Y.
Filed Nov. 18, 1987, Ser. No. 123,653
Term of patent 14 years
U.S. Cl. D23—366

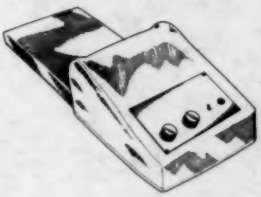
306,645
PREGNANCY TEST KIT
James E. Parker, Long Beach, Calif., assignor to V-Tech, Inc., Pomona, Calif.
Filed Dec. 14, 1987, Ser. No. 132,866
Term of patent 14 years
U.S. Cl. D24—17



306,646
REHABILITATION THERAPY BOARD
George O. Cotton, 7021 E. Gross Rd., Bloomington, Ind. 47401
Filed Nov. 16, 1987, Ser. No. 121,589
Term of patent 14 years
U.S. Cl. D24—36



306,647
MASSAGER OR SIMILAR ARTICLE
Robert J. Plummer, Indianapolis, Ind., assignor to Medical Product Designs, Inc., Indianapolis, Ind.
Filed Jun. 8, 1987, Ser. No. 59,390
Term of patent 14 years
U.S. Cl. D24—40



306,648

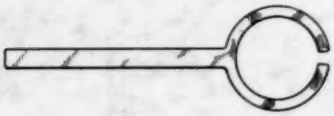
SPECIMEN CUP HOLDER

Robert D. Jones, and Lori D. Wilkes, both of 2334 Twisted Oak Dr., Norman, Okla. 73071

Filed Jan. 22, 1987, Ser. No. 6,606

Term of patent 14 years

U.S. Cl. D24—54



306,649

BLOOD COLLECTION VIAL

James D. Lapicola, Martinez, Calif., and William C. Buxbaum, Plano, Tex., assignors to Hematronix, Inc., Plano, Tex.

Filed Nov. 2, 1987, Ser. No. 115,195

Term of patent 14 years

U.S. Cl. D24—56

LIST OF PATENTEES

TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A.I.R., Inc.: *See*—
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A. L. Hansen Manufacturing Co.: *See*—
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A.O. Smith Corporation: *See*—
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Lemense, Rodney A., 4,907,570, Cl. 126-373.000.

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Lilja, Jan E.; and Nilsson, Sven E. L., 4,907,606, Cl. 131-273.000.

AB Tetra Pak: *See*—
Traegaardh, Paul; and Nantin, Hans, 4,908,091, Cl. 156-502.000.

Abbott, Floyd J.: *See*—
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Acer Incorporated: *See*—
Chung, J. M.; and Kung, Jerry, 4,908,637, Cl. 346-160.000.

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McIntyre, Frederic S., 4,907,741, Cl. 239-124.000.

Adams, Michael W.; and Masih, Shabir Z., to Eastman Kodak Company. Lactylic salt tablet formulations and tablets. 4,908,210, Cl. 424-439.000.

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Adeka Argus Chemical Co., Ltd.: *See*—
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Advanced Tobacco Products, Inc.: *See*—
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Leemans, Luc E.; Uytterhoeven, Herman J.; Teyssie , Philippe J.; Fayt, Roger M.; and de Jaeger, Nikolaas C., 4,908,155, Cl. 252-353.000.
Vervloet, Ludovicus H.; De Smedt, Willy P.; Vermeulen, Leon L.; and Kok, Piet, 4,908,286, Cl. 430-10.000.

Agostinelli, John A.: *See*—
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Akazawa, Shigeo: *See*—
Mori, Masaharu; Hamatsu, Masahiro; and Akazawa, Shigeo, 4,908,837, Cl. 375-1.000.

Ake, DuWain K., to Spectra-Physics, Inc. Detection and display device. 4,907,874, Cl. 356-4.000.

Akiike, Katsumi; and Ichikawa, Haruo, to Fuji Electric Co., Ltd. Thermal overload relay. 4,908,594, Cl. 337-49.000.

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Akzo America Inc.: *See*—
Page, Theron V., Jr.; Boydston, Thomas F.; and Posa, John G., 4,908,243, Cl. 427-445.000.

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Rodriguez, Alan; Rose, John A.; Waller, Clifford B.; and Doyle, Anthony W., 4,907,911, Cl. 405-154.000.
Anis, Aziz Y. Cataract removal technique. 4,908,015, Cl. 604-22.000.
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Kusano, Hiroshi; Kiniwa, Hideaki; Shimura, Akihiro; and Annaka, Masahiko, 4,908,392, Cl. 521-60.000.
Anritsu Corporation: *See*—
Kuroyone, Kazuo, 4,907,480, Cl. 83-552.000.
Anstey, Nigel A. Seismic exploration using compressional and shear waves simultaneously. 4,907,670, Cl. 181-121.000.
Anthony, Albert M., to Bangor Electronics Co. Static convergence device for television picture tube. 4,908,591, Cl. 335-210.000.
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Antonious, Anthony J. Perimeter weighted iron type golf club head with upper alignment and sighting area and centrally located complementary weight. 4,907,806, Cl. 273-164.000.
Antonov, Alexandr A.: *See*—
Petrov, Vyacheslav V.; Grinko, Dmitry A.; Antonov, Alexandr A.; and Krjuchin, Andrei A., 4,908,814, Cl. 369-100.000.
Anzai, Hisao: *See*—
Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; Anzai, Hisao; and Makino, Hideaki, 4,908,402, Cl. 524-495.000.

Anzeveno, Peter, to Merrell Dow Pharmaceuticals Inc. Synthesis of intermediate useful in the preparation of nojirimycin and related compounds. 4,908,439, Cl. 536-17.400.

Aoki, Kazuo: *See—*
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,907,877, Cl. 356-121.000.

Aoki, Mitsuo: *See—*
Watansbe, Yoichiro; Aoki, Mitsuo; Isoda, Tetsuo; Nakayama, Nobuhiro; Sasaki, Fumiliiro; and Kakigawa, Karumi, 4,908,290, Cl. 430-106.600.

Aoki, Shinobu: *See—*
Takaki, Usaji; Aoki, Shinobu; Yamamoto, Yoshihiro; and Hara, Isao, 4,908,472, Cl. 560-104.000.

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Iriyama, Norio; Shijo, Kunio; and Aoki, Yutaka, 4,908,714, Cl. 358-405.000.

Aoshima, Shinzi; and Narusawa, Sadayuki, to Yamaha Corporation. Synchronizing signal reproducing circuit in a disc playback device. 4,908,812, Cl. 369-59.000.

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Aoyama, Masashige: *See—*
Nishida, Masanori; Aoyama, Masashige; and Onodera, Hiroshi, 4,908,681, Cl. 357-23.300.

Aoyama, Toshio: *See—*
Maeda, Kannosuke; and Aoyama, Toshio, 4,908,043, Cl. 23-302.00T.

APC-Onsite, Inc.: *See—*
Hollinger, Theodore G., 4,908,744, Cl. 363-4.000.

Apsell, Sheldon P.; and Stapelfeld, Norval D., to Lo-Jack Corporation. Apparatus for locating and/or tracking stolen or missing vehicles and the like. 4,908,629, Cl. 342-457.000.

APV Chemical Machinery Inc.: *See—*
Loomans, Bernard A.; Kowalczyk, James E.; Lange, Harold A.; and Jones, Jerry W., 4,908,104, Cl. 201-25.000.

Arad, Abraham; and Kennedy, Melvin, to Tiger Electronics, Inc. Pocket sized toy game. 4,907,804, Cl. 273-93.00R.

Arai, Masakazu; Endo, Hiroshi; Gotoh, Toshihiro; Yagi, Toshio; Tanaka, Masanori; Saito, Masanori; and Mathuno, Shigeki, to Mitsubishi Yuka Badische Co., Ltd. Propylene resin foamed particles and foamed mold article. 4,908,393, Cl. 521-60.000.

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Arai, Michio. Shield mounting assembly for a safety helmet. 4,907,299, Cl. 2-424.000.

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Kirikami, Seiichi; Sato, Isao; Hirose, Fumiyuki; Arai, Osamu; and Iizuka, Nobuyuki, 4,907,406, Cl. 60-39.182.

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Kanai, Masahiro; Murakami, Tsutomu; Arai, Takayoshi; and Kawakami, Soichiro, 4,908,329, Cl. 437-101.000.

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Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, 4,908,473, Cl. 560-104.000.

Arakawa, Hideo: *See—*
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.

Araki, Keisuke; and Ohta, Kenichi, to Canon Kabushiki Kaisha. Apparatus for periodically generating second harmonic. 4,907,850, Cl. 350-96.130.

Aramaki, Minoru; Nakano, Hisazi; and Kubo, Masahiro, to Central Glass Company, Ltd. Method of converting fluorine-containing polymer into lower molecular weight polymer. 4,908,415, Cl. 525-356.000.

Arashi, Norio: *See—*
Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, 4,907,962, Cl. 431-174.000.

Arcade, Inc.: *See—*
Carnahan, David W.; and Rabin, Edward I., 4,908,252, Cl. 428-27.000.

Arditty, Herve ; Le Boudec, Gilles; Graindorge, Philippe; Gerardin, Jean-Pierre; Lesne, Jean-Louis; and Meyet, Dominique, to Electricite De France. Device for discriminating fluids having different refractive indices and device for measuring the voluminal fraction of at least one fluid of a current of non-mixible fluids incorporating the discrimination device. 4,907,878, Cl. 356-128.000.

Arene, Francois, to Societe d'Etudes, de Realisations et d'Applications Techniques. Tandem projectiles connected by a wire. 4,907,512, Cl. 102-476.000.

Arimoto, Akira; Saito, Susumu; Tsuji, Yasuyuki; Namikawa, Osamu; and Mochizuki, Takeshi, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Laser power control for cut-paper printer. 4,908,634, Cl. 346-108.000.

Arita, Hitoshi: *See—*
Egashira, Noritaka; and Arita, Hitoshi, 4,908,345, Cl. 503-227.000.

Arlt, Dieter: *See—*
Zecher, Wilfried; Arlt, Dieter; and Sayed, Aziz E., 4,908,429, Cl. 528-353.000.
Zecher, Wilfried; Arlt, Dieter; Schrader, Lutz; and Waldenrath, Werner, 4,908,430, Cl. 528-353.000.

Armatron International, Inc.: *See—*
Conigliaro, Anthony, Jr., 4,907,365, Cl. 43-112.000.

Armini, Anthony J.: *See—*
Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., 4,908,030, Cl. 623-16.000.

Armstrong, Ennels D. Steering wheel shaft lock assembly. 4,907,427, Cl. 70-252.000.

Armstrong, Scott W.: *See—*
Ewener, Patrick C.; Bristow, Duncan J.; Armstrong, Scott W.; Dallaire, Louis C.; and Thompson, John A., 4,908,082, Cl. 156-94.000.

Arndt, Otto; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Single-vessel process for preparing 2-acetaminonaphthalene-6-sulfonic acid of high purity. 4,908,478, Cl. 562-55.000.

Arnold, Morris A., III. Portable electrically heated animal drinking water container. 4,908,501, Cl. 219-438.000.

Arnulf, Paul: *See—*
Dunand, Josiane; Arnulf, Paul; and Gasquet, Denis, 4,907,816, Cl. 280-615.000.

Aronson, Michael P.: *See—*
Hessel, John F.; Cardinali, Martin S.; and Aronson, Michael P., 4,908,150, Cl. 252-174.120.

Aryaev, Vadim L.: *See—*
Kresjun, Valentin I.; Aryaev, Vadim L.; Rudenko, Georgy M.; Vrublevsky, Andrei G.; Kostev, Fedor I.; Maximovich, Roman Y., eceased; and Maximovich, Roman Y., administrator, 4,908,374, Cl. 514-330.000.

Asahi Glass Company Ltd.: *See—*
Muto, Ryujiro, 4,907,861, Cl. 350-336.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Shibasaki, Ichiro; and Kajino, Takashi, 4,908,685, Cl. 357-27.000.

Asahi Kogaku Kogyo K.K.: *See—*
Shindo, Osamu; Suzuki, Noboru; and Toji, Shigeo, 4,908,644, Cl. 354-402.000.

Asano, Seiji: *See—*
Komatsuzaki, Hiroshi; Asano, Seiji; and Fujita, Yoshihiro, 4,908,642, Cl. 354-400.000.

Asano, Yoshikatsu: *See—*
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,907,877, Cl. 356-121.000.

Ascii Corporation: *See—*
Ishii, Takatoshi; and Kishioka, Kazuya, 4,908,700, Cl. 358-22.000.

ASEA Brown Boveri Ltd.: *See—*
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Ashida, Kaneyoshi, to Fischer, Harry. Fire retardant for isocyanate-based foams comprising ammonium sulfate and a cyanuric acid derivative. 4,908,161, Cl. 252-609.000.

Ashitaka, Hidetomo: *See—*
Takahashi, Toru; Shimizu, Ryuichi; Suehiro, Tsuomu; and Ashitaka, Hidetomo, 4,908,283, Cl. 429-192.000.

Ashok, Sankaranarayanan; and Melillo, Thomas J., to Olin Corporation. Asymmetrical gas-atomizing device and method for reducing deposite bottom surface porosity. 4,907,639, Cl. 164-46.000.

Assael, David; and Lincoln, Brian, to Hughes Aircraft Company. Adaptive thresholding technique. 4,908,875, Cl. 382-52.000.

Assink, Kenneth. Substrate convering method and apparatus. 4,908,084, Cl. 156-212.000.

AT&T Bell Laboratories: *See—*
Chraplyvy, Andrew R.; Koch, Thomas L.; and Tkach, Robert W., 4,908,833, Cl. 372-96.000.

Atlas Pacific Engineering Company: *See—*
Meissner, Konrad; and Quay, Marvin F., 4,907,687, Cl. 198-394.000.

Atlas Powder Company: *See—*
Mullay, John J.; and Sohara, Joseph A., 4,907,368, Cl. 44-51.000.

Atochem: *See—*
Boutillier, Jacques; Forichon, Noelle; and Lermat, Yves, 4,908,408, Cl. 525-124.000.

August Bunger Bob-Textilwerk KG GmbH & Co.: *See—*
Bunger, Hans-Joachim; and Kuttenkeuler, Bernhard, 4,907,635, Cl. 160-84.100.

Auhorn, Werner; Degen, Hans-Juergen; Hoehr, Lothar; and Riebeling, Ulrich, to BASF Aktiengesellschaft. Printability of paper. 4,908,240, Cl. 427-391.000.

Automation Equipment Company: *See—*
Simone, Raymond J., 4,907,889, Cl. 360-92.000.

Avdel Systems Limited: *See—*
Jeal, Harvey P.; and Summerlin, Frederick A., 4,907,922, Cl. 411-43.000.

Ayasli, Yalcin, to Hittite Microwave Corporation. Non-reciprocal bidirectional duplexer. 4,908,820, Cl. 370-38.000.

Ayers, William. Mobile atom insertion reaction, mobile atom transmissive membrane for carrying out the reaction, and reactor incorporating the mobile atom transmissive membrane. 4,908,114, Cl. 204-252.000.

Ayres, Donald B.; and Forsthoff, Mark A. Device for automatically securing a borderwire on a mattress innerspring. 4,907,327, Cl. 29-91.000.

Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki. Low NOx burner. 4,907,962, Cl. 431-174.000.

B. Braun-SSG AG: *See*—
Seidel, Dietrich; Wieland, Heinrich; Rosskopf, Gerhard; and Feller, Wolfgang, 4,908,354, Cl. 514-21.000.
B-Line Systems, Inc.: *See*—
Rinderer, Eric R., 4,907,766, Cl. 248-57.000.
Baba, Hiroyuki: *See*—
Wakai, Yoichi; and Baba, Hiroyuki, 4,908,710, Cl. 358-236.000.
Babcock-BSH Aktiengesellschaft vormals Buttner-Shilde-Haas AG: *See*—
Krautzberger, Dieter, 4,907,631, Cl. 144-230.000.
Babcock-Hitachi Kabushiki: *See*—
Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, 4,907,962, Cl. 431-174.000.
Babcock & Wilcox Company, The: *See*—
Allmon, William E.; and Berthold, John W., 4,907,883, Cl. 356-317.000.
Lane, John D.; Matsko, Theodore N.; Patella, Joseph G.; and Scheib, Thomas J., 4,908,747, Cl. 364-162.000.
Lawrie, William E.; and Petrak, Daniel R., 4,907,455, Cl. 73-644.000.
Babel, Wolfgang: *See*—
Westphal, Robert; and Babel, Wolfgang, 4,907,485, Cl. 89-1.110.
Bacha, Donald J.: *See*—
Harvey, Donald W.; Fung, Bing-Fai; and Bacha, Donald J., 4,908,802, Cl. 367-149.000.
Back, Per Ingvar M., to Telefonaktiebolaget L M Ericsson. Method and apparatus for controlling the magnitude and direction of a current through a winding. 4,908,562, Cl. 318-696.000.
Badger, John P., to Hollingsworth and Vose Company. Recombinant battery and plate separator therefor. 4,908,282, Cl. 429-59.000.
Baer, Thomas M., to Spectra-Physics, Inc. High efficiency mode-matched solid-state laser with transverse pumping. 4,908,832, Cl. 372-75.000.
Bailey, John M.; and Zadoks, Abraham L., to Caterpillar Inc. High pressure gasifier and diesel cycle internal combustion engine system. 4,907,565, Cl. 123-23.000.
Baird, James C.; Koger, Thurman J., II; Muckenfuhs, Delmar R.; and Spahni, Milton D., to Procter & Gamble Company, The. Article including segment which is elastically shirrable after manufacture. 4,908,247, Cl. 428-34.900.
Baird, Lincoln F. Orthopedic chair. 4,907,303, Cl. 4-480.000.
Baker, Benjamin H.: *See*—
Taylor, David W.; and Baker, Benjamin H., 4,907,490, Cl. 91-36.000.
Baker, Thomas M.; Dunn, Michael T.; Duven, Jeffrey E.; Hackler, Jim W.; Louden, Peter J.; and Schjoneman, Clifford M., to Boeing Company, The. Abnormal start advisory system (ASAS) for aircraft engines. 4,908,618, Cl. 340-945.000.
Baker, Timothy J.; Woods, John H.; and Zerr, Jeffrey R., to Petrolite Corporation. Additive composition for water-based inks. 4,908,063, Cl. 106-31.000.
Bala, Paul F.; Kupcis, Edgars A.; and Fisher, William B., to Boeing Company, The. Aircraft stall warning system. 4,908,619, Cl. 340-966.000.
Baldwin, Judith A. M., to Strategic Financial Communications Corp. Notebook with selectively changeable, removeable and replaceable information carriers. 4,907,904, Cl. 402-80.00R.
Balfour, Robert S. Mosquito control. 4,907,366, Cl. 43-132.100.
Ballobes ApS: *See*—
Jacobsen, Erik; Overland, Christian; Northeved, Allan; and Langkaer, Carsten, 4,908,011, Cl. 600-12.000.
Balmforth, Brian; and Hughes, Nigel, to Imperial Chemical Industries PLC. Water-soluble dye. 4,908,062, Cl. 106-22.000.
Balsells, Joan C.: *See*—
Balsells, Peter J., 4,907,788, Cl. 267-168.000.
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Bangor Electronics Co.: *See*—
Anthony, Albert M., 4,908,591, Cl. 335-210.000.
Banjo, Toshinobu: *See*—
Nakagawa, Osamu; Yanagitani, Koji; Sasaki, Ikuo; and Banjo, Toshinobu, 4,908,178, Cl. 264-272.17.0.
Bankuty, Geza E.; Byron, LeRoy F.; and Cianciullo, Joseph J., to New England Machinery, Inc. Apparatus for testing the release torque of container caps. 4,907,700, Cl. 209-546.000.
Bar-Tana, Jacob; Migron, Yoelit; Blum, Jochanan; Dreckmann, Bruno; and Pill, Johannes, to Epis S.A. α-halogenated dicarboxylic acids, pharmaceutical compositions and method of use. 4,908,385, Cl. 514-574.000.
Bark, Jeffrey E.; and Young, Keith A., to Medical Engineering Corporation. Flexible needle stop. 4,908,029, Cl. 623-8.000.
Barker, Brian P., to Allied-Signal Inc. Variable displacement hydraulic servomotor system. 4,907,408, Cl. 60-451.000.
Barosi, Aldo; and Boffito, Claudio, to SAES Getters S.p.A. Non-evaporable ternary gettering alloy, particularly for the sorption of water and water vapor in nuclear reactor fuel elements. 4,907,948, Cl. 417-53.000.
Barrett, Lawrence G. Irradiator and method of using irradiator to irradiate. 4,908,221, Cl. 426-240.000.
Barsotti, Robert J.; and Corcoran, Patrick H., to Du Pont de Nemours, E. I., and Company. Multi-component coating composition comprising an anhydride containing polymer, a glycidyl component and a self-stabilized dispersion resin. 4,908,397, Cl. 523-400.000.
Bartlett, Robert R.: *See*—
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,908,364, Cl. 514-243.000.
Basebaum, Allan I.: *See*—
Levine, Jon D.; and Basebaum, Allan I., 4,908,387, Cl. 514-653.000.
BASF Aktiengesellschaft: *See*—
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, 4,908,448, Cl. 544-289.000.
Auhorn, Werner; Degen, Hans-Juergen; Hoehr, Lothar; and Riebeling, Ulrich, 4,908,240, Cl. 427-391.000.
Boyd, Jack D.; Mead, William T.; and Biermann, Theodore F., 4,908,088, Cl. 156-307.300.
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,908,414, Cl. 525-316.000.
Goertz, Hans-Helmut; Straub, Ferdinand; Vogel, Friedrich; Frosch, Franz; Naegele, Paul; and Raubenheimer, Hans-Juergen, 4,908,413, Cl. 525-304.000.
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.
Hansen, Guenter; Dix, Johannes P.; Reichelt, Helmut; and Hayashi, Masahiro, 4,908,437, Cl. 534-738.000.
Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, 4,908,477, Cl. 560-248.000.
Hoffmann, Werner; and Degner, Dieter, 4,908,481, Cl. 568-308.000.
Lach, Dietrich; Eckert, Guenter; Maltry, Werner; and Fischer, Karl, 4,908,239, Cl. 427-389.000.
Mayer, Udo; and Raulfs, Friedrich-Wilhelm, 4,908,447, Cl. 544-124.000.
Sterzel, Hans-Josef; and Mair, Gunther, 4,908,172, Cl. 264-63.000.
BASF Corporation: *See*—
Ludwig, Juergen, 4,907,659, Cl. 175-20.000.
Basil, Richard V., Jr.; and Leetmaa, Juri G., to Hughes Aircraft Company. Dielectrically loaded waveguide switch. 4,908,589, Cl. 333-106.000.
Basile, Carlo: *See*—
Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., 4,908,697, Cl. 358-12.000.
Baskin, David, to Suncor Corporation. Simulated stone. 4,908,257, Cl. 428-147.000.
Bastioli, Catia; Bellotti, Vittorio; and Del Giudice, Luciano, to Montefibre S.p.A. Quick-crystallizing polyester composition. 4,908,428, Cl. 528-272.000.
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Ammende, Sonya; Erdmann, Hartmut; Etzkorn, Heinz-Werner; and Zucholl, Klaus, 4,908,118, Cl. 204-424.000.
Battistella, Guido, to Stal Samifi S.p.A. Automatic platefreezer, with horizontal freezing plates, suitable to apply pressure on the product during normal freezing operations. 4,907,421, Cl. 62-341.000.
Bauer, Alberto. Guillotine biopsy needle provided with flexible stylus and cannula. 4,907,598, Cl. 128-753.000.
Bauer, Walter; Muller, Jurgen; and Voigtlander, Volkmar, to Agfa-Gevaert AG. Processing and treating device for x-ray film cassettes. 4,908,514, Cl. 250-327.200.
Baumberger, Philippe, to Campagnie Generale D'Automatisme CGa-HBS. System for automatically reading indentification data disposed on a vehicle. 4,908,500, Cl. 235-384.000.
Bausch, Gregory G.; Seelbach, Elizabeth A.; and Zombeck, Alan, to Dow Corning Corporation. Method of enhancing fabric rewettability with an aqueous emulsion of branched and cross-linked polydimethylsiloxane. 4,908,140, Cl. 252-8.600.
Bayer Aktiengesellschaft: *See*—
Dullings, Josef; Kloker, Werner; Freitag, Dieter; Lusgen, Holger; Schmid, Helmut; and Winchenbach, Helmut, 4,908,216, Cl. 425-3.000.
Jensen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, 4,908,377, Cl. 514-404.000.
Leitz, Edgar; Eichenauer, Herbert; and Ott, Karl-Heinz, 4,908,416, Cl. 525-411.000.
Leitz, Edgar; Eichenauer, Herbert; Ott, Karl-Heinz; Eckel, Thomas; Peters, Horst; and Schoeps, Jochen, 4,908,422, Cl. 527-67.000.
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 4,908,366, Cl. 514-252.000.
Zecher, Wilfried; Arlt, Dieter; and Sayed, Aziz E., 4,908,429, Cl. 528-353.000.
Zecher, Wilfried; Arlt, Dieter; Schrader, Lutz; and Waldenrath, Werner, 4,908,430, Cl. 528-353.000.
Bayer, Ernst; and Rapp, Wolfgang, to Bayer, Ernst. Graft copolymers of crosslinked polymers and polyoxyethylene, processes for their production, and their usage. 4,908,405, Cl. 525-61.000.
Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Traffic light control system and method. 4,908,615, Cl. 340-917.000.
Bayyouk, Jacob A.: *See*—
Fraser, Howard H., Jr.; and Bayyouk, Jacob A., 4,907,414, Cl. 62-56.000.
Beanlands, Peter: *See*—
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Beck, Josef; Hachtel, Hans; and Tobler, Alfred, to Hilti Aktiengesellschaft. Fastening member for securement into hard materials. 4,907,928, Cl. 411-387.000.

Becker, Benedikt: *See*—
Jensen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, 4,908,377, Cl. 514-404.000.
Becker, Charlton D.: *See*—
Eisner, Mark R.; and Becker, Charlton D., 4,907,968, Cl. 433-80.000.
Becker Enterprises: *See*—
Becker, Richard W., 4,907,620, Cl. 137-893.000.
Becker, Mollie M.: *See*—
Sukiennik, Corrine A.; and Becker, Mollie M., 4,908,026, Cl. 604-378.000.
Becker, Richard W., to Becker Enterprises. Proportioner pumping system. 4,907,620, Cl. 137-893.000.
Beckman Instruments, Inc.: *See*—
Zakowski, Jack J.; Cuomo, Vincent A.; Blanke, Gordon C.; and Meyer, Richard C., 4,908,320, Cl. 436-45.000.
Beckmann, Franz; and Wagner, Armand, to Laborlux S. A. Method for producing form bodies, such as briquettes. 4,908,167, Cl. 264-29.300.
Bedell, Glenn W.; Greene, Benjamin; Davis, Marion; and Abbott, Floyd J., to Bio-Recovery Systems, Inc. Sensors for dissolved substances in fluids. 4,908,676, Cl. 356-72.000.
Bednarz, James W. Lockable water meter expansion connection and method. 4,907,450, Cl. 73-201.000.
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Robinson, Jeffery H.; and Dodd, Ian, 4,908,204, Cl. 424-94.200.
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Beloff, Arthur L., to Cigar Savor, Inc. Device for extinguishing and saving cigars. 4,907,604, Cl. 131-256.000.
Beloit Corporation: *See*—
Bielagus, Joseph B., 4,907,702, Cl. 209-664.000.
Cronin, Dennis C.; and Lange, David V., 4,908,103, Cl. 162-358.000.
Bendix France: *See*—
Gautier, Jean-Pierre; Perez, Miguel; and Verbo, Pedro, 4,907,494, Cl. 91-369.300.
Bendix Limited: *See*—
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Bennett, Christopher J.; Hobza, James M.; Katznelson, Ron D.; and Walker, Gordon K., to M/A-COM Government Systems, Inc.; and Cable/Home Communication Corp. Receiver access interface to service components in television channel. 4,908,859, Cl. 380-10.000.
Bennett, Peter C.; and Clarke, Rodney J., to Imperial Chemical Industries PLC. Coupling. 4,907,749, Cl. 239-690.000.
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DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.
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Bernard, Leuvrey. Article for identifying pieces of timber. 4,908,503, Cl. 235-489.000.
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Larson, Duane B.; and Korzow, Nick, Jr., 4,907,433, Cl. 72-8.000.
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Bhasin, Madan M., to Union Carbide Chemicals and Plastics Company Inc. Catalyst composition for oxidation of ethylene to ethylene oxide. 4,908,343, Cl. 502-218.000.
Bianco, Sebastiano, to Hoechst Aktiengesellschaft. Method for treating asthma. 4,908,382, Cl. 514-471.000.
Bidigare, Richard G.: *See*—
Molitor, Gerald R.; and Bidigare, Richard G., 4,907,372, Cl. 51-38.000.
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Bio-Recovery Systems, Inc.: *See*—
Bedell, Glenn W.; Greene, Benjamin; Davis, Marion; and Abbott, Floyd J., 4,908,676, Cl. 356-72.000.
Biocontrol Technology, Inc.: *See*—
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Gezari, Walter; and Gezari, Daniel Y., 4,907,797, Cl. 272-129.000.
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Chamoun, Nassib G., 4,907,597, Cl. 128-731.000.
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Bland, Ralph H.; Peper, William A.; and Stambaugh, Bruce D., to Minnesota Mining and Manufacturing Company. Severable multilayer thermoplastic film. 4,908,278, Cl. 428-500.000.
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Blecha, Bill A., to United States of America, Army. Apache helmet mounting structure for aviators night vision imaging system (ANVIS) and method. 4,907,296, Cl. 2-6.000.
Block, Siegmar, to Bochumer Eisenhutte Heintzmann GmbH & Co. KG. Shaking control unit for a hydraulic cylinder. 4,907,918, Cl. 405-303.000.
Blokkum, Dag R.; Johns, Charles R.; Morozink, Lee J.; and Peterson, David L., to International Business Machines Corporation. Method and system for automatically assigning memory modules of different predetermined capacities to contiguous segments of a linear address range. 4,908,789, Cl. 364-900.000.
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Blount, David H. Flexible glass. 4,908,339, Cl. 501-32.000.
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Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., 4,908,116, Cl. 204-299.00R.
Bobee, Jean-Marc; and Melin, Christian, to Synthelabo. Pharmaceutical tablet for the treatment of uraemia. 4,908,214, Cl. 424-477.000.
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Byers, William N.; and Gilliland, Richard G., 4,908,577, Cl. 324-207.200.
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Boggan, Elvis W.; and Campbell, Carl M., to Visa International Service Association. Transaction approval system. 4,908,521, Cl. 235-380.000.
Bohringer, Paul. Crusher housing. 4,907,753, Cl. 241-285.00R.
Boikov, Vladimir P.: *See*—
Kozachevsky, Gennady G.; Guskov, Valery V.; Boikov, Vladimir P.; Gorodnichev, Jury N.; Sizova, Svetlana I.; Moroz, Viktor A.; Kachur, Isaak Y.; Kholmovsky, Alexandr S.; and Lapshina, Nadezhda V., 4,908,090, Cl. 156-446.000.
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Bolger, John G., to Inductran Corporation. Mechanical torque converter. 4,907,474, Cl. 475-14.000.
Bolt, John D.; Mahler, Walter; Tebbe, Frederick N.; and Young, Robert J., Jr., to Du Pont de Nemours, E. I., and Company. Aluminum nitride flakes and spheres. 4,908,197, Cl. 423-412.000.
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Borgerson, James: *See*—
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Borodulin, German; Shkolnik, Alexander; Persidsky, Maxim; and Thuroff, Joachim W., to Urological Instruments Research, Inc. Vibrational method for accelerating passage of stones from ureter. 4,907,572, Cl. 606-128.000.
Bottelberghe, Scott A., to Ethyl Corporation. Aluminoxane process. 4,908,463, Cl. 556-179.000.
Bouchard, William L.; Sudol, Charles W.; and Wing, Keith E., Sr., to Norton Company. Plate mounted grinding wheel. 4,907,376, Cl. 51-209.00R.
Bouiller, Jean G.; Jourdain, Gerard E. A.; and Loubet, Marc G., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Assembly of two bodies having distinctly different coefficients of expansion. 4,907,743, Cl. 239-265.110.
Boulot, Dominique, to Clecim. Axial support device for a cylinder with rotating sleeve. 4,907,329, Cl. 29-116.200.
Bou-Mikael, Sami, to Texaco Inc. Metal-to-metal packer seal for downhole disconnectable pipe joint. 4,907,651, Cl. 166-114.000.
Bourdage, Fernand J., to Joyride Company. Wheelchair lift for vehicles. 4,907,936, Cl. 414-545.000.
Bourg, Wilfred M., Jr.: *See*—
Henson, James K.; Bourg, Wilfred M., Jr.; and Henson, William D., 4,907,720, Cl. 222-55.000.
Bourrat, Andre, to Sam Outillage S.A. Winding brake for spring-return tape measure. 4,907,756, Cl. 242-107.300.
Boutillier, Jacques; Forichon, Noelle; and Lermat, Yves, to Atochem. Hot melt adhesive containing hydroxyl-functional ethylene-vinyl acetate and blocked polyisocyanate. 4,908,408, Cl. 525-124.000.
Bovenkerk, Harold P.: *See*—
Csillag, Frank J.; and Bovenkerk, Harold P., 4,907,377, Cl. 51-309.000.
Bowen, David C., to Robinson Nugent, Inc. Self-retaining connector. 4,907,978, Cl. 439-79.000.
Bowes, Emmerson; and Smith, Fritz A., to Mobil Oil Corporation. Catalytic dewaxing process using binder-free zeolite. 4,908,120, Cl. 208-59.000.
Bowley, Heather J.; and Gerrard, Donald L., to British Petroleum Company p.l.c., The. Diamond separation process. 4,907,875, Cl. 356-30.000.
Box, Gary W.; Foote-Lennox, Thomas S.; Herreid, Rodney G.; Hoff, James F.; Leisz, Dennis J.; Perlick, John A.; Steeden, Terry T.; Turner, John J.; and Alexander, Curtis R., to Wave Technologies, Inc. Method and apparatus for asynchronous time measurement. 4,908,784, Cl. 364-569.000.
Box, Larry, to Scott Paper Company. Modified cellulosic fibers. 4,908,097, Cl. 162-9.000.
Boyd, Jack D.; Mead, William T.; and Biermann, Theodore F., to BASF Aktiengesellschaft. Extreme damage tolerant graphite composites and method of making same. 4,908,088, Cl. 156-307.300.
Boyd, Jerry L.: *See*—
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Brachtl, Bruno O.; Coppersmith, Don; Hyden, Myrna M.; Matyas, Stephen M., Jr.; Meyer, Carl H. W.; Oseas, Jonathan; Pilpel, Shaiy; and Schilling, Michael, to International Business Machines Corporation. Data authentication using modification detection codes based on a public one way encryption function. 4,908,861, Cl. 380-25.000.
Brandeis University: *See*—
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Breault, Michelle S.; and Steinmetz, John H., to Pitney Bowes, Inc. Mail management system account validation and fallback operation. 4,908,770, Cl. 364-464.020.
Breckle, Andreas. Pocket-spring core mattress. 4,907,309, Cl. 5-477.000.
Breen, Brian E.; and Harris, Ian R., to Lucas Electrical Electronic Systems Limited. Temperature-sensitive resistance element. 4,908,599, Cl. 338-22.00R.
Breisch, Harald, to Zahnradfabrik Friedrichshafen AG. Ball drain valve for the piston space of a rotary multi-disc clutch. 4,907,684, Cl. 192-106.00F.
Bres, Michel; and Tisserand, Francois, to Thomson-CSF. Motor-driven device for preadjusted frequency tunings for a klystron. 4,908,549, Cl. 315-5.470.
Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., to Imperial Chemical Industries plc. Pharmaceutical compositions. 4,908,380, Cl. 514-452.000.
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Brien, Andre . Light diffusing ring for wristwatch. 4,908,739, Cl. 362-23.000.
Brill, Jurgen, to Schandt Maschinenbau GmbH. Wheelhead for grinding machines. 4,907,374, Cl. 51-168.000.
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Bristol Myers Company: *See*—
Sterzycki, Roman Z.; Mansuri, Muzammil M.; and Martin, John C., 4,908,440, Cl. 536-23.000.
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Broerken, Herbert: *See*—
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Bromley, Eric; and Harris, Robert, to Penguin Products, Inc. Computer input-output device. 4,908,612, Cl. 340-706.000.

Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, to BASF Aktiengesellschaft. Preparation of impact-resistant poly(alkyl)styrene. 4,908,414, Cl. 525-316.000.

Brookins, Robert H., to Combustion Engineering, Inc. Reinforced inflatable seal. 4,908,179, Cl. 376-203.000.

Broome, William S.: *See*—
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Brother Kogyo Kabushiki Kaisha: *See*—
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Ishikawa, Shigeo; Tokuda, Hiroshi; and Ninomiya, Akira, 4,908,632, Cl. 346-76.0PH.
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Brown, Claudia D., executrix: *See*—
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Brown, Douglas S., to American Metal Products Company. One-piece lever for multi-louvered damper. 4,907,500, Cl. 98-110.000.

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Miller, Joseph T.; and Brown, Edward F., 4,907,694, Cl. 206-0.810.

Brown, George R.: *See*—
Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., 4,908,380, Cl. 514-452.000.

Brown, Ivan R., deceased (by Brown, Claudia D., executrix); Eaton, Brian M.; and Carlyle, Robert B., to Hardinge Brothers, Inc. Apparatus and process for assembling a machine tool and machine tool formed thereby. 4,907,478, Cl. 82-149.000.

Brown, Russell: *See*—
Leis, Michael; Muchnik, Michael J.; Simmons, Elmer; Brown, Russell; and Rub, Bernardo, 4,908,841, Cl. 375-81.000.

Brown, Stuart I.: *See*—
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Brucker, Milton. Device to manipulate side view mirrors for motor vehicles. 4,907,870, Cl. 350-637.000.

Brungardt, Trueman A., to T.A.V., Inc. Semi solid ethanol based fuel. 4,908,044, Cl. 44-7.600.

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Brunswick Corporation: *See*—
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Brussino, Giovanni, to S.I.P.A.P. Sas Di Demichelis Margherita & C. Procedure for the production of magnetic plastic laminate. 4,908,164, Cl. 264-22.000.

Buck, S. Gretchen: *See*—
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Bucknam, Neil E.: *See*—
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Buda, Charles: *See*—
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Buell Industries, Inc.: *See*—
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Bugg, Richard E. F., to U.S. Philips Corporation. Teletext decoder arrangements. 4,908,706, Cl. 358-147.000.

Buhler, Ulrich; Hahnke, Manfred; Kunze, Michael; and Bode, Albert. Process for coloring cellulose on polyester with water-insoluble red mono-azo dyes. 4,908,042, Cl. 8-639.000.

Builder, Stuart E.: *See*—
Bennett, William F.; Builder, Stuart E.; and Gatlin, Larry A., 4,908,205, Cl. 424-94.640.

Bulkens, Catherine S. Trash can with integral dustpan for utilization of plastic liners with handles. 4,907,710, Cl. 220-1.0OT.

Buller, Clarence S., to University of Kansas. Water insoluble polysaccharide polymer and method thereof. 4,908,310, Cl. 435-101.000.

Bullock, Charles B.: *See*—
Bullock, Rose S., 4,908,244, Cl. 428-8.000.

Bullock, Rose S., to Bullock, Charles B. Ornamental holiday decoration. 4,908,244, Cl. 428-8.000.

Bulman, Melvin J., to General Electric Company. Liquid propellant gun. 4,907,511, Cl. 102-440.000.

Bulmer, Catherine: *See*—
Kersey, Alan D.; Bulmer, Catherine; and Dandridge, Anthony, 4,907,849, Cl. 350-96.140.

Bunger, Hans-Joachim; and Kuttenkeuler, Bernhard, to August Bunger Bob-Textilwerk KG GmbH & Co. Liftable window drape. 4,907,635, Cl. 160-84.100.

Burchatz, Rory J. Multi function exercise machine. 4,907,798, Cl. 272-134.000.

Burger, Rita; and Pissulla, Horst, to Wilhelm Ruf KG. Rotary potentiometer. 4,908,598, Cl. 338-174.000.

Burgoyne, William F., Jr.; and Dixon, Dale D., to Air Products and Chemicals, Inc. Process for producing mono-ortho-ethyl-aniline using silica-alumina catalysts. 4,908,480, Cl. 564-409.000.

Burin, Ralph R.: *See*—
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 4,907,419, Cl. 62-263.000.

Burns, Robert V.; and Gupta, Sanjay, to Siemens Transmission Systems, Inc. Isolated drive circuit. 4,908,857, Cl. 379-418.000.

Burrahm, Robert W., to Southwest Research Institute. Turbocharged two-stroke internal combustion engine with four-stroke capability. 4,907,544, Cl. 123-26.000.

Burston, Ronald J. Laser system with laser actuation means. 4,907,588, Cl. 606-11.000.

Burt, Williard F.: *See*—
Grosso, Paul V.; Morgan, Michael J.; Wing, Feagin A., Jr.; and Burt, Williard F., 4,908,301, Cl. 430-45.000.

Burysek, Frantisek; and Hortlik, Frantisek, to Vyzkumny Ustav Bavlnarsky. Cop tube feeding device for textile machines. 4,907,755, Cl. 242-35.50A.

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Busche, Charles A.: *See*—
Cavallaro, Joseph L.; Richards, Arthur J., Jr.; and Busche, Charles A., 4,907,992, Cl. 440-50.000.

Butcher, R. E.; and Henderson, A. A., Jr., to Speed Sort, Inc. Method and apparatus for sorting randomly positioned garments minimizing serting conveyor movement. 4,907,699, Cl. 209-3.300.

Butler, Kenneth C.: *See*—
Moise, John C.; Wampler, Richard K.; and Butler, Kenneth C., 4,908,012, Cl. 600-16.000.

Buzas, Andre ; Merour, Jean-Yves; and Ollivier, Roland. Benzhydryloxyethylpiperazine derivatives, processes for their preparation and pharmaceutical compositions in which they are present. 4,908,365, Cl. 514-252.000.

Byers, William N.; and Gilliland, Richard G., to Boeing Company, The. System for monitoring the gap between, and relative position of, relatively movable elements. 4,908,577, Cl. 324-207.200.

Byron, LeRoy F.: *See*—
Bankuty, Gezi E.; Byron, LeRoy F.; and Cianciullo, Joseph J., 4,907,700, Cl. 209-546.000.

C F Braun Inc.: *See*—
Grotz, Bernard J.; and Good, Clive R., 4,907,643, Cl. 165-1.000.

C.K.T. Investments Limited: *See*—
Lines, Kerry S., 4,908,249, Cl. 428-36.900.

Cabanaw, Boyd E., to Amoco Corporation. Sulfur recovery process including removal of residual sulfur from Claus catalyst after regeneration. 4,908,201, Cl. 423-574.00R.

Cabassi, Peter J.: *See*—
Mackenzie, James M. W.; and Cabassi, Peter J., 4,908,125, Cl. 209-166.000.

Cable/Home Communication Corp.: *See*—
Bennett, Christopher J.; Hobza, James M.; Katznelson, Ron D.; and Walker, Gordon K., 4,908,859, Cl. 380-10.000.

Caillod, Jack: *See*—
Sauvion, Guy-Nool; and Caillod, Jack, 4,908,199, Cl. 423-437.000.

Caillot, Claude: *See*—
Dalle, Bernard M.; Caillot, Claude; and Legros, Francois A., 4,908,156, Cl. 252-511.000.

Caleshu, Peter V.: *See*—
Shaffer, John W.; Caleshu, Peter V.; and Johnston, David W., 4,908,546, Cl. 313-331.000.

Calgon Corporation: *See*—
Hunter, W. E.; and Falcione, Ronald J., 4,908,100, Cl. 162-168.300.

California Institute of Technology: *See*—
Maserjian, Joseph, 4,908,686, Cl. 357-30.000.

Call, David B.; Nolan, James A.; and Lassman, Steven J., to A.I.R., Inc. Meteorological data encoder for measuring atmospheric conditions. 4,907,449, Cl. 73-170.00R.

Callahan, James F.; Huffman, William F.; Newlander, Kenneth A.; and Yim, Nelson C. F., to SmithKline Beckman Corporation. Intermediates for preparing 1,6-dicarba-vasopressin compounds. 4,908,475, Cl. 560-115.000.

Callut, Francois J., to Ryan Investments, B.V. Method and apparatus for separating and recovering particulate material. 4,908,139, Cl. 210-788.000.

Calmettes, Lionel; and Andre, Michel, to Etablissements Caillau. Metal clamp. 4,907,319, Cl. 24-20.00R.

Camar S.p.A.: *See*—
Marchetti, Sergio, 4,907,770, Cl. 248-188.600.

Cameron, Dugald; and Friedrich, Karl, to Chrysler Motors Corporation. Front axle for an all-wheel drive vehicle. 4,907,669, Cl. 180-248.000.

Campagnie Generale D'Automatisme CGa-HBS: *See*—
Baumberger, Philippe, 4,908,500, Cl. 235-384.000.

Campbell, Carl M.: *See*—
Boggan, Elvis W.; and Campbell, Carl M., 4,908,521, Cl. 235-380.000.

Campbell, Ian B.: *See*—
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; Campbell, Ian B.; Middlemiss, David; and Willbe, Charles, 4,908,386, Cl. 514-605.000.

Campbell, Patricia S.: *See*—
Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 4,908,027, Cl. 604-890.100.

Camphouse, Charles H.: *See*—
Fang, Shou-Mean; and Camphouse, Charles H., 4,907,340, Cl. 29-610.100.

Canon Kabushiki Kaisha: *See*—
Anayama, Hideki, 4,908,288, Cl. 430-58.000.
Arai, Takayoshi; Kanai, Masahiro; Kawakami, Soichiro; and Murakami, Tsutomu, 4,908,330, Cl. 437-170.000.

Araki, Keisuke; and Ohta, Kenichi, 4,907,850, Cl. 350-96.130.
Hara, Hiroshi; Sonobe, Hiraku; Shihou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, 4,907,858, Cl. 350-286.000.
Higashihara, Masaki; Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, 4,908,645, Cl. 354-402.000.
Kanai, Masahiro; Murakami, Tsutomu; Arai, Takayoshi; and Kawakami, Soichiro, 4,908,329, Cl. 437-101.000.
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,907,866, Cl. 350-426.000.
Kitagishi, Nozomu; and Yamazaki, Shoichi, 4,907,868, Cl. 350-463.000.
Kumakura, Toshiyuki, 4,908,552, Cl. 315-241.00P.
Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,908,285, Cl. 430-1.000.
Matsumoto, Kohichi, 4,908,853, Cl. 379-355.000.
Saito, Atsushi; Koizumi, Yutaka; Mori, Toshihiro; and Nozawa, Minoru, 4,908,636, Cl. 346-140.00R.
Shimada, Tetsuya, 4,908,718, Cl. 358-494.000.
Takada, Yoshihiro; and Hosono, Nagao, 4,907,859, Cl. 350-331.00T.
Udagawa, Yoshiro, 4,908,701, Cl. 358-80.000.
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Canstar Sports Group Inc.: *See*—
Hall, Kenneth, 4,907,813, Cl. 280-11.180.

Cantor, Charles R.: *See*—
Van der Ploeg, Lex H. T.; Giannini, Suzanne H.; and Cantor, Charles R., 4,908,308, Cl. 435-6.000.

Caprarese, Vincent; Chretien, Thierry; and Dauvillier, Richard, to U.S. Philips Corporation. System for the secret transmission of audio signals and television receiver for receiving such signals. 4,908,860, Cl. 380-19.000.

Caprioli, Richard M.; and Cottrell, John S., to Kratos Analytical Limited. Apparatus and methods of use in the mass analysis of chemical samples. 4,908,512, Cl. 250-288.000.

Caravajal, Gregory S.; and Hatfield, Gretchen R., to Procter & Gamble Company, The. Rinse additive compositions providing glassware protection comprising insoluble zinc compounds. 4,908,148, Cl. 252-135.000.

Cardiac Control Systems, Inc.: *See*—
Harper, Clair, 4,907,592, Cl. 128-419.00P.

Cardinali, Martin S.: *See*—
Hessel, John F.; Cardinali, Martin S.; and Aronson, Michael P., 4,908,150, Cl. 252-174.120.

Carl Freudenberg, Firma: *See*—
Schwerdt, Hans-Werner, 4,907,787, Cl. 267-140.100.

Carlin, Allan R.: *See*—
Alexander, Everett L., Jr.; Carlin, Allan R.; Fiore, Alice L.; and Mackiewicz, Walter A., 4,908,759, Cl. 364-300.000.

Carlton, Richard J., to Phase 2 Automation. Transfer method using walking beam gripper. 4,907,939, Cl. 414-786.000.

Carlyle, Robert B.: *See*—
Brown, Ivan R., deceased; Eaton, Brian M.; and Carlyle, Robert B., 4,907,478, Cl. 82-149.000.

Carnahan, David W.; and Rabin, Edward I., to Arcade, Inc. Pleasant-feeling fragrance sampler containing microcapsules. 4,908,252, Cl. 428-27.000.

Carnall, Edward, Jr.: *See*—
Strom, Lauri A.; Carnall, Edward, Jr.; Ferranti, Steven A.; and Mir, Jose M., 4,908,346, Cl. 505-1.000.

Carr, Albert A.; Cheng, Hsien C.; and Kane, John M., to Merrell Dow Pharmaceuticals Inc. Antihistaminic piperidinyl benzimidazoles. 4,908,372, Cl. 514-322.000.

Carr, Scott: *See*—
Hudgins, Richard D.; and Carr, Scott, 4,908,740, Cl. 362-144.000.

Carre, Roland: *See*—
Anthouard, Pierre; and Carre, Roland, 4,908,625, Cl. 342-25.000.

Carrier Corporation: *See*—
Fraser, Howard H., Jr.; and Bayyouk, Jacob A., 4,907,414, Cl. 62-56.000.

Carswell, Edwin R.: *See*—
McCann, Denis J.; Williams, Allan; Carswell, Edwin R.; and Broome, William S., 4,907,843, Cl. 303-111.000.

Carter, David G.; Green, Derek J.; and Clark, Anthony J., to National Starch and Chemical Corp. Rounding of hard cover books. 4,907,822, Cl. 281-15.100.

Carver, Terry. Shield for electric meter puller. 4,907,334, Cl. 29-278.000.

Casady, Donald R.; and Teodorescu, Ioan V., to Seiscor Technologies, Inc. Integrated data voice multiplexer supporting handshake and loop-back protocols. 4,908,819, Cl. 370-15.000.

Casey, Jeremiah P.; and Clift, Susan M., to Air Products and Chemicals, Inc. Diaminobenzoate catalytic chain extenders. 4,908,394, Cl. 521-163.000.

Cashen, Ernest R.; and Holder, Peter A. R., to E M I Limited. Radar apparatus. 4,908,628, Cl. 342-134.000.

Casler, Richard J., Jr.: *See*—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Booth, Barrett L., 4,908,556, Cl. 318-568.200.

Cassani, Giovanni: *See*—
Riva, Ernesto; Denaro, Maurizio; Ferrari, Pietro; and Cassani, Giovanni, 4,908,351, Cl. 514-8.000.

Cassella Aktiengesellschaft: *See*—
Schulz, Hans-Ulrich, 4,908,202, Cl. 424-9.000.

Cassina S.p.A.: *See*—
Pesce, Gaetano, 4,907,328, Cl. 29-91.100.

Castonguay, Roger N.; Palmieri, Joseph M.; and Scott, Graham A., to General Electric Company. Method of assembling a molded case circuit breaker current transformer assembly. 4,907,342, Cl. 29-622.000.

Caterpillar Inc.: *See*—
Bailey, John M.; and Zadoks, Abraham L., 4,907,565, Cl. 123-23.000.
Mills, Floyd D., 4,907,545, Cl. 123-41.350.

Cavallaro, Joseph L.; Richards, Arthur J., Jr.; and Busche, Charles A., to Bird-Johnson Company. Oil distribution box for a marine controllable pitch propeller. 4,907,992, Cl. 440-50.000.

Cavallerano, Alan P.: *See*—
Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., 4,908,697, Cl. 358-12.000.

Celfa AG: *See*—
Patschorke, Joachim, 4,907,508, Cl. 101-401.100.

Cemen-Tech, Inc.: *See*—
Lepper, Larry G., 4,907,890, Cl. 366-27.000.

Central Glass Company, Ltd.: *See*—
Aramaki, Minoru; Nakano, Hisazi; and Kubo, Masahiro, 4,908,415, Cl. 525-356.000.
Tabata, Yutaka; Nishikawa, Toshio; and Sakai, Hiroshi, 4,907,370, Cl. 51-5.00D.

Centre National De La Recherche Scientifique (CNRS): *See*—
Gabis, Victor; and Gailly, Christian, 4,907,642, Cl. 164-457.000.

Centrum Baden Molekularnych i Makromolekularnych -PAN: *See*—
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.

Cerami, Anthony: *See*—
Ulrich, Peter C.; and Cerami, Anthony, 4,908,446, Cl. 540-553.000.

Chadwick, Peter E., to Plessey Overseas Limited. Quadrature signals generator. 4,908,532, Cl. 307-512.000.

Chai, Mong H. Safety device to prevent baby carriages from being accidentally folded. 4,907,818, Cl. 280-642.000.

Chambers, Bertha D.: *See*—
Chambers, Thomas E., 4,907,603, Cl. 131-175.000.

Chambers, Thomas E., to Chambers, Bertha D. Safety smoke. 4,907,603, Cl. 131-175.000.

Chamoun, Nassib G., to Biometrak Corporation. Cerebral biopotential analysis system and method. 4,907,597, Cl. 128-731.000.

Champagne, Patrick J.; and Grimsley, John L., to Laserdrive Limited. Voice coil motor with linearized force constant. 4,908,816, Cl. 369-215.000.

Champseix, Henri; and Champseix, Serge, to ABX. Linear displacement sampling valve and a device for fixing same. 4,907,463, Cl. 73-863.730.

Champseix, Serge: *See*—
Champseix, Henri; and Champseix, Serge, 4,907,463, Cl. 73-863.730.

Chan, Paul S.: *See*—
Shimirak, Gerald L.; Chan, Paul S.; and Messner, Darcey, 4,908,482, Cl. 174-93.000.

Chance, Jeff. Moisture sensing apparatus and interior protection system. 4,908,554, Cl. 318-483.000.

Chang, Chin-Fong: *See*—
Das, Santosh K.; and Chang, Chin-Fong, 4,908,181, Cl. 420-405.000.

Chang, Michael C., to Western Atlas International, Inc. Alignable, threaded, sealed connection. 4,907,828, Cl. 285-24.000.

Chang, Yan P. Thermal energy from environmental fluids. 4,907,410, Cl. 60-641.600.

Chao, Tien-Hsin; and Liu, Hua-Kuang, to United States of America, National Aeronautics and Space Administration. Real-time image difference detection using a polarization rotation spacial light modulator. 4,908,702, Cl. 358-93.000.

Chapel, Roy W., Jr.; and Duperon, David N., to John Fluke Mfg. Co., Inc. Compound resistor manufacturing method. 4,907,341, Cl. 29-612.000.

Chaplin, Daniel J.; Trethewey, Paul M.; Hansen, Christopher R.; and Angell, R. Barry, to Grass Valley Group, Inc., The. Component video accumulation effect. 4,908,699, Cl. 358-22.000.

Chapman, Richard A., to Texas Instruments, Incorporated. Counter-doped transistor. 4,908,327, Cl. 437-44.000.

Chapman, Robert M.: *See*—
Menchetti, Robert J.; and Chapman, Robert M., 4,907,773, Cl. 248-287.000.

Chase, Elaine; Clitherce, Adrian M.; Shepherd, Edward T.; and Beanlands, Peter. Cathode ray tube apparatus. 4,908,550, Cl. 315-8.000.

Chaturvedi, Nishith: *See*—
Benedict, Christine V.; and Chaturvedi, Nishith, 4,908,404, Cl. 525-54.110.

Chen, Wei-Chih; Michaud, Michael A.; and Hou, Kenneth C., to Cuno, Incorporated. Heavy metal removal process. 4,908,137, Cl. 210-679.000.

Chenausky, Peter P. RF transformer and diagnostic technique therefor. 4,908,585, Cl. 333-24.00R.

Cheng, Hsien C.: *See*—
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Cheng, Wu-Cheng: *See*—
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Cheris, Albert B.: *See*—
Alger, Andrew L.; Polhemus, Marlan H.; Cheris, Albert B.; and Gibson, Richard L., 4,907,703, Cl. 211-10.000.
Chesapeake Laser Systems, Inc.: *See*—
Merry, J. Bradford; and Hubin, Thomas, 4,907,863, Cl. 350-358.000.
Chi, Mely C., to Bell Telephone Laboratories. Integrated circuits with component placement by rectilinear partitioning. 4,908,772, Cl. 364-491.000.
Chiba, Akira, to Envirocycle Pty. Ltd. Composite bacteria support medium. 4,908,128, Cl. 210-150.000.
Child, Jack R., to Paper Corporation of America. Convertible shipping carton. 4,907,693, Cl. 206-44.00R.
Chilewich, Sandy; and Moskal, Kathy, to Moskal & Chilewich, Inc. Slipper sock construction and method for making same. 4,907,350, Cl. 36-19.00R.
Chin, Hsieuh-Li: *See*—
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Chin, Stephen; and Duhl, David N., to United Technologies Corporation. High strength single crystal superalloys. 4,908,183, Cl. 420-448.000.
Chirigos, John N.: *See*—
Palusamy, Sam S.; Schmertz, John C.; Li, Dali; Chirigos, John N.; Bond, Charles B.; and Yang, Chuang Y., 4,908,775, Cl. 364-508.000.
Chisso Corporation: *See*—
Goto, Yasuyuki, 4,908,152, Cl. 252-299.630.
Chivas Products Limited: *See*—
Lorence, Brian S.; and Phelps, Richard A., 4,907,775, Cl. 248-311.200.
Chmela, John: *See*—
Sarnoff, Norton; Fletcher, Carl; and Chmela, John, 4,908,487, Cl. 219-10.55E.
Cho, Kyujin; and Rasnick, David W., to Prototek, Inc. Method of detecting cysteine proteases. 4,908,309, Cl. 435-23.000.
Choate, Thomas G. A.: *See*—
Gunderson, Richard H.; Gardner, Terry N.; and Choate, Thomas G. A., 4,907,914, Cl. 405-224.000.
Choiniere, Stanley W., to Olympic Manufacturing Group, Inc. Locking plate for fastening insulation. 4,907,927, Cl. 411-368.000.
Chou, Tai-sheng; and Kiliany, Thomas R., Jr., to Mobil Oil Corp. Method and apparatus for forming and ion-exchanging a filter cake. 4,908,136, Cl. 210-661.000.
Chow, Philip Y.: *See*—
Yang, Y. C.; and Chow, Philip Y., 4,907,312, Cl. 14-21.000.
Chraplyvy, Andrew R.; Koch, Thomas L.; and Tkach, Robert W., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Distributed feedback laser for frequency modulated communication systems. 4,908,833, Cl. 372-96.000.
Chretien, Thierry: *See*—
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Chrisler, Tanner S. Isolating container for live animals. 4,907,536, Cl. 119-15.000.
Christain, Jeffrey J.; Gould, Ross; and Gandionco, Isidro, to Advanced Cardiovascular Systems, Inc. Device for connecting extendable guidewire sections for cardiovascular procedures. 4,907,332, Cl. 29-237.000.
Christensen, Jorgen: *See*—
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Chrysler Motors Corporation: *See*—
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Holbrook, Gerald L., 4,907,475, Cl. 74-867.000.
Kuusik, Uno; and Plotzke, Ronald J., 4,907,681, Cl. 192-4.00A.
Wroblewski, Thomas R., 4,908,822, Cl. 370-85.000.
Chung, J. M.; and Kung, Jerry, to Acer Incorporated. Font cartridge adapter. 4,908,637, Cl. 346-160.000.
Chupp, John P.; Lee, Len F.; Goure, William F.; and Molyneaux, John M., to Monsanto Company. Substituted 2,6-substituted 1,2- or 1,6-dihydro pyridine compounds. 4,908,057, Cl. 71-92.000.
Cianciullo, Joseph J.: *See*—
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Ciba-Geigy Corporation: *See*—
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Drabek, Jozef; and Ehrenfreund, Josef, 4,908,383, Cl. 514-485.000.
Huebner, Charles F.; and Francis, John E., 4,908,376, Cl. 514-402.000.
Meyer, Willy; and Oertle, Konrad, 4,908,467, Cl. 560-12.000.
Moerker, Theophile; and Peter, Heinrich, 4,908,371, Cl. 514-318.000.
Mulhaupt, Rolf; Simon, Hubert; and Cotting, Jacques-Alain, 4,908,406, Cl. 525-64.000.
Naef, Rudolf; and Eckhardt, Claude, 4,908,040, Cl. 8-137.000.
Roth, Martin; and Monnier, Charles E., 4,908,423, Cl. 528-97.000.
Scheibli, Peter, 4,908,436, Cl. 534-637.000.
Tsao, Fupao; and Penley, Allen, 4,908,147, Cl. 252-106.000.
Urech, Karl; and Moser, Roland, 4,908,273, Cl. 428-413.000.
Ciezarek, Krzysztof J.: *See*—
Hoffman, Jerzy; and Ciezarek, Krzysztof J., 4,908,588, Cl. 333-105.000.
Cigar Savor, Inc.: *See*—
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Cincinnati Milacron Inc.: *See*—
Hertzer, Ronald A., 4,907,960, Cl. 425-593.000.
Vaniglia, Milo M., 4,907,754, Cl. 242-7.210.
Ciokajlo, John J.; and Vogt, Daniel S., to General Electric Company. Resiliently mounted outlet guide vane. 4,907,946, Cl. 415-209.300.
Cirtek Corporation: *See*—
Taylor, David W.; and Baker, Benjamin H., 4,907,490, Cl. 91-36.000.
Claassen, Henning J. Apparatus for liquefying a thermoplastic plastic. 4,907,629, Cl. 141-82.000.
Claesson, Hans. Drag anchor. 4,907,523, Cl. 114-304.000.
Claremon, David A., to Merck & Co., Inc. Process for preparing nitriles. 4,908,452, Cl. 546-286.000.
Clarion Co., Ltd.: *See*—
Mori, Masaharu; Hamatsu, Masahiro; and Akazawa, Shigeo, 4,908,837, Cl. 375-1.000.
Clark, Anthony J.: *See*—
Carter, David G.; Green, Derek J.; and Clark, Anthony J., 4,907,822, Cl. 281-15.100.
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., to Diffracto Ltd. Non destructive testing and other applications using retroreflective illumination. 4,907,888, Cl. 356-371.000.
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Bennett, Peter C.; and Clarke, Rodney J., 4,907,749, Cl. 239-690.000.
Clarkson, Ian; Abel, Bruce; and Sedgley, Douglas W., to Grumman Aerospace Corporation. Regenerable cryosorption pump with movable physical barrier and physical barrier thereof. 4,907,413, Cl. 62-55.500.
Claussen, Nils; Jahn, Jurgen; and Petzow, Gunter, to Max-Planck-Gesellschaft zur Foedering der Wissenschaften e.V. Method of sintering articles of silicon nitride. 4,908,171, Cl. 264-56.000.
Clecim: *See*—
Boulot, Dominique, 4,907,329, Cl. 29-116.200.
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, to Uclaf, Roussel. N-(1H-indole-4-yl)-benzamides. 4,908,367, Cl. 514-253.000.
Clerc, Jean-Michel, to Thomson-CSF. Medium-frequency rotating joint for antenna. 4,908,630, Cl. 343-763.000.
Clift, Susan M.: *See*—
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Clitheroe, Adrian M.: *See*—
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CMB Packaging (UK) Limited: *See*—
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Coal Industry (Patents) Limited: *See*—
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Cobbs, David C.: *See*—
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Cobbs, James H.; and Cobbs, David C. Rock cutting tool. 4,907,664, Cl. 175-374.000.
Coca-Cola Company, The: *See*—
Wing, George R., Jr.; and Rudick, Arthur G., 4,907,724, Cl. 222-105.000.
Cocuzza, Anthony J., to Du Pont de Nemours, E. I., and Company. Reagents for the preparation of 5'-biotinylated oligonucleotides. 4,908,453, Cl. 548-113.000.
Cohen, Richmond R.; and McCarty, Jimmie D., to Hercules Incorporated. Method of increasing the hardness of cigarette filter elements. 4,907,609, Cl. 131-332.000.
Colburn, Richard: *See*—
Sutton, Christopher; and Colburn, Richard, 4,908,597, Cl. 338-21.000.
Colgate-Palmolive Co.: *See*—
Holland, Richard J.; and Buda, Charles, 4,908,039, Cl. 8-137.000.
Colley, Charles K., to Robert Abraham Limited. Apparatus for making tiles or slabs. 4,908,217, Cl. 425-253.000.
Collins, Galen. Flash synchronized gated sample clock generator. 4,908,842, Cl. 375-119.000.
Colman, Robert W.; and Schmaier, Alvin H., to Temple University-of the Commonwealth System of Higher Education. Monoclonal antibodies to human kininogen and methods of preparing same. 4,908,431, Cl. 530-387.000.
Colon, Jean; and Marion, Pierre. Valve incorporating at least one rocking flap with respect to elastic pivots. 4,908,028, Cl. 623-2.000.
Columbia University in the City of New York, The Trustees of: *See*—
Levinthal, Cyrus; and Fine, Richard M., 4,908,781, Cl. 364-524.000.
Van der Ploeg, Lex H. T.; Giannini, Suzanne H.; and Cantor, Charles R., 4,908,308, Cl. 435-6.000.
Coma Julia, Concepcion, to Laboratories Boi, S.A. Process for the preparation of 7-(2-diethylaminoethyl)-theophylline acetyl salicylate and use thereof. 4,908,111, Cl. 204-157.620.
Combustion Engineering, Inc.: *See*—
Brookins, Robert H., 4,908,179, Cl. 376-203.000.
Combustion Power Company: *See*—
Goldbach, Gary O.; and O'Hagan, Michael A., 4,908,124, Cl. 209-139.100.
Combustion Tec, Inc.: *See*—
Neff, Glenn C., 4,907,963, Cl. 431-189.000.
Commissariat A l'Energie Atomique: *See*—
Meyer, Robert, 4,908,539, Cl. 315-169.300.

Compressor Components Textron Inc.: *See—*
Pekarek, Herbert C.; and Pryatel, Richard D., 4,908,782, Cl. 364-560.000.
Coneglio, Ben: *See—*
Pittman, John; and Pittman, Enid, 4,908,068, Cl. 134-4.000.
Coneglio, Ruth: *See—*
Pittman, John; and Pittman, Enid, 4,908,068, Cl. 134-4.000.
Conigliaro, Anthony, Jr., to Armatron International, Inc. Electrocuting grid for an electronic insect trap, and method of fabricating same. 4,907,365, Cl. 43-112.000.
Connell, John W.: *See—*
Hergenrother, Paul M.; and Connell, John W., 4,908,426, Cl. 528-125.000.
Conru, H. Ward; Goss, Stephen E.; Osborne, Gordon C., Jr.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., to International Business Machines Corporation. Method of bonding gold or gold alloy wire to lead tin solder. 4,907,734, Cl. 228-123.000.
Conserve, Inc.: *See—*
Harris, Kenneth J., 4,907,738, Cl. 237-2.00B.
Constraves Goerz Corporation: *See—*
Lordo, Robert E.; and McSparran, Lloyd W., 4,908,558, Cl. 318-648.000.
Cook, Alexander; and Reynolds, Richard W., to Sundstrand Corporation. Power generating system. 4,908,565, Cl. 322-10.000.
Cook, Edward J.; and Lagace, Arthur P., to Biotechnology Development Corporation. Method of forming a microemulsion. 4,908,154, Cl. 252-314.000.
Cook Incorporated: *See—*
Gianturco, Cesare, 4,907,336, Cl. 29-515.000.
Cook, Phillip D.; and McNamara, Dennis J., to Warner-Lambert Company. Deoxyadenosine compounds and methods of making and using the same. 4,908,441, Cl. 536-27.000.
Cooper Industries, Inc.: *See—*
Martinez, Louis, 4,908,600, Cl. 340-310.00R.
Meyer, Danny S., 4,907,812, Cl. 277-117.000.
Cooper, Rick: *See—*
Ishii, Kaoru; Wilkinson, Thomas F.; Dwyer, Stephen J.; and Cooper, Rick, 4,908,495, Cl. 219-343.000.
Coops, Peter; and Duijvestijn, Adrianus J., to U.S. Philips Corporation. Apparatus for optically scanning a radiation-reflecting information plane. 4,908,506, Cl. 250-201.500.
Coppersmith, Don: *See—*
Brachtl, Bruno O.; Coppersmith, Don; Hyden, Myrna M.; Matyas, Stephen M., Jr.; Meyer, Carl H. W.; Oseas, Jonathan; Pilpel, Shaiy; and Schilling, Michael, 4,908,861, Cl. 380-25.000.
Corcoran, Patrick H.: *See—*
Barsotti, Robert J.; and Corcoran, Patrick H., 4,908,397, Cl. 523-400.000.
Corey, Ronald J.; and Stavisky, Theodore, to Fancort Industries, Inc. Process and device for forming leads. 4,907,628, Cl. 140-105.000.
Corning Incorporated: *See—*
Jones, Kelly E.; and Noll, Frederick E., 4,908,054, Cl. 65-30.110.
Martuscello, Peter J.; and Rittenhouse, Philip J., 4,907,896, Cl. 374-190.000.
Corrion, Steven G.: *See—*
Rumpf, Robert J.; Refior, Lawrence M.; Klebba, Lenard D.; and Corrion, Steven G., 4,907,757, Cl. 242-107.600.
Corsi, Paul J.; and Russell, Richard H., to Hubbell Incorporated. Stackable modular duct assemblies. 4,907,767, Cl. 248-49.000.
Cosman, Eric R. Automatic over-temperature control apparatus for a therapeutic heating device. 4,907,589, Cl. 606-34.000.
Cosmos, Pete; Mosser, Benjamin H., III; and Ohl, William C., to AMP Incorporated. One-piece molded insulating housing for a circular din connector. 4,908,335, Cl. 439-79.000.
Costerousse, Germain; Gosin d'Ambrieres, Solange; and Teutsch, Jean-Georges, to Uclaf, Roussel. 1-dethia-2-thia-cephalosporanic acids. 4,908,359, Cl. 514-210.000.
Cote , Linda G.: *See—*
Moore, Patrick D.; Rolen, Jack L.; and Cote , Linda G., 4,908,149, Cl. 252-139.000.
Cotic, Dennis J., to Oak Industries, Inc. Automatic high speed tie plate reorienting mechanism. 4,907,686, Cl. 193-45.000.
Cotting, Jacques-Alain: *See—*
Mulhaupt, Rolf; Simon, Hubert; and Cotting, Jacques-Alain, 4,908,406, Cl. 525-64.000.
Cottrell, John S.: *See—*
Caprioli, Richard M.; and Cottrell, John S., 4,908,512, Cl. 250-288.000.
Counts, Gerald W. Sonic windmill for bicycles. 4,908,000, Cl. 446-216.000.
Courcol, Michel-Andre: *See—*
Graton, Michel; Courcol, Michel-Andre; and Thiebaut, Jacques, 4,908,004, Cl. 464-68.000.
Cox, Bobby E., to Shell Offshore, Inc. Method for protecting a shallow water well. 4,907,657, Cl. 175-9.000.
Cranford, Luther W.: *See—*
Sieroslawski, Donald L.; and Cranford, Luther W., 4,907,318, Cl. 19-255.000.
Crill, Philip D.; and Leliakov, Igor P., to Ford Aerospace & Communications Corporation. Spacecraft fuel measurement. 4,908,776, Cl. 364-509.000.
Cronin, Dennis C.; and Lange, David V., to Beloit Corporation. Bearing blanket for an extended nip press having laminates of different hardnesses. 4,908,103, Cl. 162-358.000.
Cruisers, Incorporated: *See—*
Ginter, L. James; and Kurz, K. Thomas, 4,907,673, Cl. 182-81.000.
Crum, Peter, to Oscar Mayer Foods Corporation. Merchandiser assembly. 4,907,707, Cl. 211-59.300.
Crumb, Donald A.; Gaiser, Robert F.; and Steer, John E., to Allied-Signal Inc. Pressure-balanced proportioning valve with vent-controlled bypass. 4,908,522, Cl. 303-9.720.
Crystal Pools, Inc.: *See—*
Meincke, Jonathan E., 4,907,610, Cl. 134-56.00R.
Csaszar, Edward F., to General Kap Corporation. Double bead track cap system. 4,907,708, Cl. 215-252.000.
Caillag, Frank J.; and Bovenkerk, Harold P., to General Electric Company. Directional catalyst alloy sweep through process for preparing diamond compacts. 4,907,377, Cl. 51-309.000.
Csordas, Elemer: *See—*
Zag, Heinz; Meinecke, Albrecht; Kolb, Otmar; Mullner, Josef; Csordas, Elemer; and Egelhof, Dieter, 4,908,102, Cl. 162-264.000.
Cubbins, Thomas D.; Hope, Thomas R.; and Michels, John M., to Boeing Company, The. Data compression method for telemetry of vibration data. 4,908,785, Cl. 364-576.000.
Cuevas, Jess, to Talley Automotive Products, Inc. Lightweight nonwelded gas generator with rolled spun lip. 4,907,819, Cl. 280-736.000.
Cullen, Walter P.; Oscarson, John R.; Tone, Junsuke; and Maeda, Hiroshi, to Pfizer Inc. Streptomyces sp. N664-30 which produces an ionophore antibacterial agent. 4,908,316, Cl. 435-253.400.
Cummings, Joel W.: *See—*
Vasconcellos, Alfred V.; Teodorescu, Ionel E.; Cummings, Joel W.; and McBeth, Dean E., 4,907,591, Cl. 606-154.000.
Cunningham, James R.: *See—*
Wark, Rickey E.; and Cunningham, James R., 4,907,751, Cl. 241-119.000.
Cuno, Incorporated: *See—*
Chen, Wei-Chih; Michaud, Michael A.; and Hou, Kenneth C., 4,908,137, Cl. 210-679.000.
Cuomo, Vincent A.: *See—*
Zakowski, Jack J.; Cuomo, Vincent A.; Blanke, Gordon C.; and Meyer, Richard C., 4,908,320, Cl. 436-45.000.
Cur, Omer N.: *See—*
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 4,907,419, Cl. 62-263.000.
Curator of the University of Missouri, The: *See—*
Stewart, William E., Jr.; Greer, Michael E.; and Dona, Carol L. G., 4,907,415, Cl. 62-66.000.
Curlee, James D. Orthopaedic device using non-stretch material and method for its manufacture. 4,907,576, Cl. 128-78.000.
Custon Seamless Guttering: *See—*
Ealer, James E., 4,907,381, Cl. 52-12.000.
Cybelec S.A.: *See—*
Maillefer, Jean-Claude, 4,907,432, Cl. 72-1.000.
Cyngier, Roseann M.: *See—*
Loza, Roman; and Cyngier, Roseann M., 4,908,141, Cl. 252-8.554.
D.I.E.N.E.S. Apparatebau GmbH: *See—*
Lehle, Erhard, 4,908,564, Cl. 318-807.000.
D. Klein & Son, Inc.: *See—*
Shaw, Anthony J.; and Paricio, Lawrence W., 4,907,774, Cl. 248-306.000.
Dabney, Upton R., to Hoover Group, Inc. Limited deflection spring. 4,907,785, Cl. 267-104.000.
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Booth, Barrett L., to Unimation Inc. Modular robot control system. 4,908,556, Cl. 318-568.200.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Egashira, Noritaka; and Arita, Hitoshi, 4,908,345, Cl. 503-227.000.
Daido Metal Company, Ltd.: *See—*
Mori, Sanae, 4,907,626, Cl. 138-156.000.
Daido, Toshihiko: *See—*
Taniguchi, Manabu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, 4,907,460, Cl. 73-862.330.
Daidotokushuko Kabushikikaisha: *See—*
Sasaki, Takeshi; and Morita, Kiyoharu, 4,907,438, Cl. 72-235.000.
Daikin Industries Ltd.: *See—*
Ohsaka, Yohnosuke; and Takaki, Shoji, 4,908,460, Cl. 549-511.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Abe, Morio; and Yokota, Ichiro, 4,907,709, Cl. 215-252.000.
Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, 4,907,956, Cl. 425-110.000.
Daiwa Seiko Co., Ltd.: *See—*
Takeuchi, Shinji; and Shimozaki, Tetsuya, 4,907,759, Cl. 242-246.000.
Dale Electronics, Inc.: *See—*
Plough, Charles T., Jr., 4,908,185, Cl. 420-588.000.
Dale, Greogry B.: *See—*
Kressly, Richard H.; Dale, Greogry B.; and Plant, William J., 4,907,933, Cl. 414-334.000.
Dall'aglio, Carlo; Danielli, Franco; and Golinelli, Guido, to Marposs Societa per Azioni. Apparatus for checking diametral dimensions of mechanical pieces. 4,907,345, Cl. 33-544.300.
Dallaire, Louis C.: *See—*
Ewener, Patrick C.; Bristow, Duncan J.; Armstrong, Scott W.; Dallaire, Louis C.; and Thompson, John A., 4,908,082, Cl. 156-94.000.
Dallas Semiconductor Corporation: *See—*
Lee, Robert D.; Kurkowski, Hal; and Bolan, Michael L., 4,908,796, Cl. 365-189.050.
Little, Wendell L.; and Grider, Stephen N., 4,908,790, Cl. 364-900.000.

Dalle, Bernard M.; Caillot, Claude; and Legros, Francois A., to Electricite de France (Service National). Self-regulating heating element and a process for the production thereof. 4,908,156, Cl. 252-511.000.

Daly, Paul D., to Siemens-Bendix Automotive Electronics L.P. One-piece wave deflector for I.C. engine intake system. 4,907,547, Cl. 123-52.00M.

Dampney, Ian T.; and Good, Michael, to Helmets Limited. Helmet and visor mechanism therefor. 4,907,300, Cl. 2-424.000.

Dandliker, Rene, to Wild Heerburgg, AG. Method and apparatus for two-wavelength interferometry with optical heterodyne processes and use for position or range finding. 4,907,886, Cl. 356-349.000.

Dandridge, Anthony: *See—*
Kersey, Alan D.; Bulmer, Catherine; and Dandridge, Anthony, 4,907,849, Cl. 350-96.140.

Danieau, Jacques, to Valeo. Rigid device for installation of heating and/or air conditioning in an automobile. 4,907,497, Cl. 98-2.080.

Danieli & C. Officine Meccaniche SpA: *See—*
Poloni, Alfredo; and Drigani, Fausto, 4,907,437, Cl. 72-225.000.

Danielli, Franco: *See—*
Dall'aglio, Carlo; Danielli, Franco; and Golinelli, Guido, 4,907,345, Cl. 33-544.300.

Danna, Gary F.: *See—*
Vigo, Tyrone L.; Zimmerman, Cynthia M.; Bruno, Joseph S.; and Danna, Gary F., 4,908,238, Cl. 427-389.000.

Danner, H. Jack: *See—*
Danner, Michael R.; and Danner, H. Jack, 4,907,799, Cl. 273-23.000.

Danner, Michael R.; and Danner, H. Jack. Extensible-retractable pool and billiard cue bridgestick. 4,907,799, Cl. 273-23.000.

Danziger, Leslie A.: *See—*
Hagerty, James J.; and Danziger, Leslie A., 4,907,864, Cl. 350-413.000.

Dapperheld, Steffen; Schwertfeger, Werner; and Wildt, Manfred, to Hoechst Aktiengesellschaft. Process for preparing fluorinated vinyl ethers. 4,908,107, Cl. 204-59.00F.

Darby, Robert J.: *See—*
Powel, Stephen S.; and Darby, Robert J., 4,907,758, Cl. 242-125.100.

Das, Santosh K.; and Chang, Chin-Fong, to Allied-Signal Inc. Ingot cast magnesium alloys with improved corrosion resistance. 4,908,181, Cl. 420-405.000.

Data General Corporation: *See—*
Marshall, Peter G.; and Feldstein, Robert, 4,908,749, Cl. 364-200.000.

Daussan, Andre: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,908,234, Cl. 427-236.000.

Daussan et Compagnie: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,908,234, Cl. 427-236.000.

Daussan, Gerard: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,908,234, Cl. 427-236.000.

Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, to Daussan et Compagnie. Method and installation for spraying a multi-layer insulating refractory coating, and the coating thus obtained. 4,908,234, Cl. 427-236.000.

Dauvillier, Richard: *See—*
Caprarese, Vincent; Chretien, Thierry; and Dauvillier, Richard, 4,908,860, Cl. 380-19.000.

Davcev, Stojan, to ASEA Brown Boveri Ltd. Antenna selector. 4,908,587, Cl. 333-101.000.

Davenport, Kenneth G.: *See—*
Elango, Varadaraj; and Davenport, Kenneth G., 4,908,476, Cl. 560-144.000.

Davidson, Peter; and Buck, S. Gretchen. Laminar flow apparatus. 4,907,304, Cl. 4-488.000.

Davies, James F.; Lee, Robert S.; Travill, Andrew W.; and Williams, Robert J., to Lever Brothers Company. Detergent granules containing simple sugars and a seed crystal for calcium carbonate. 4,908,159, Cl. 252-559.000.

Davis, Kenneth; and Anderson, Norman. Remote controlled door lock apparatus. 4,907,429, Cl. 70-279.000.

Davis, Lavelle W., II. Electronic siren interrupt system. 4,908,732, Cl. 361-170.000.

Davis, Marion: *See—*
Bedell, Glenn W.; Greene, Benjamin; Davis, Marion; and Abbott, Floyd J., 4,908,676, Cl. 356-72.000.

Davis, Robert H.; Farng, Liehpao O.; and Horodysky, Andrew G., to Mobil Oil Corporation. Dimercaptothiadiazole-derived, organic esters, amides and amine salts as multifunctional antioxidant/antiwear additives. 4,908,144, Cl. 252-47.500.

Davis, Terry W.; and Gates, James P., to R. Jenninga Manufacturing Co., Inc. Method and apparatus for controlling spring rate and leverage in a screen printing device. 4,907,506, Cl. 101-115.000.

Dawe, D'Arcy A. J.: *See—*
Reinke, Dana J.; and Dawe, D'Arcy A. J., 4,908,608, Cl. 340-571.000.

Dawe, Peter H. Device for accurately positioning and aligning a guide sleeve into a bore of a cylinder head. 4,907,333, Cl. 29-251.000.

Dayco Products, Inc.: *See—*
Henderson, Dewey D., 4,908,007, Cl. 474-135.000.

Deane, John D.; and Schumacher, Percy W., to Reed Tool Company. Rotary drill bit having improved mounting means for multiple cutting elements. 4,907,662, Cl. 175-329.000.

DeBoer, Charles; and Long, Michael, to Eastman Kodak Company. Ultrasonic pixel printer. 4,908,631, Cl. 346-76.00R.

Debus, Jurgen: *See—*
Zachrei, Jurgen; and Debus, Jurgen, 4,908,733, Cl. 361-356.000.

Dechelette, Helen M. P.: *See—*
Bertho, Dominique; Dechelette, Helen M. P.; and Mysiak, Eugene J., 4,907,990, Cl. 439-851.000.

Deckner, Andre G.; Imhof, Martin; and Zweymuller, Karl, to Sulzer Brothers Limited. Prosthesis for a hip joint. 4,908,035, Cl. 623-23.000.

DeCoste, Leonard D., Jr., to Kendall Company. Collapsible core adhesive rolls. 4,907,696, Cl. 206-411.000.

Decoustics Limited: *See—*
Hintsa, R. Albert, 4,907,637, Cl. 160-368.100.

Deere & Company: *See—*
Kasemeier, James E.; and Fichtinger, Gary R., 4,907,470, Cl. 74-606.00R.
Kuhn, John B., 4,907,466, Cl. 74-378.000.

DeFazio, Louis C. Liquid heating system particularly for use with swimming pools or the like. 4,907,418, Cl. 62-238.600.

DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., to Digivision, Inc. Apparatus and method for enhancement of image viewing by modulated illumination of a transparency. 4,908,876, Cl. 382-54.000.

Degen, Hans-Juergen: *See—*
Auhorn, Werner; Degen, Hans-Juergen; Hoehr, Lothar; and Riebeling, Ulrich, 4,908,240, Cl. 427-391.000.

Degen, Helmut: *See—*
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.

Degner, Dieter: *See—*
Hoffmann, Werner; and Degner, Dieter, 4,908,481, Cl. 568-308.000.

Deguchi, Yoshikuni; Iwarkiri, Hiroshi; Iwamoto, Kazunari; and Yonezawa, Kazuya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Glycidyl sulfonamide compound. 4,908,459, Cl. 549-215.000.

de Jaeger, Nikolaas C.: *See—*
Leemans, Luc E.; Uytterhoeven, Herman J.; Teyssie , Philippe J.; Fayt, Roger M.; and de Jaeger, Nikolaas C., 4,908,155, Cl. 252-353.000.

dejong, Joannes N. M.; Solcz, Edward J.; and Wrobbel, Edward J., to Xerox Corporation. Multi-finger hydraulic end effector. 4,907,834, Cl. 294-88.000.

De Lapasse, Philippe: *See—*
Modot, Marcel; De Lapasse, Philippe; and Maistre, Francois, 4,908,219, Cl. 426-15.000.

Del Giudice, Luciano: *See—*
Bastioli, Catia; Bellotti, Vittorio; and Del Giudice, Luciano, 4,908,428, Cl. 528-272.000.

DeLong, Edward A.; DeLong, Edward P.; Ritchie, George S.; and Rendall, W. Alan, to Tigney Technology Inc. Method for extracting the chemical components from dissociated lignocellulosic material. 4,908,098, Cl. 162-16.000.

DeLong, Edward A. Process to dissociate and extract the Lignin and the Xylan from the primary wall and middle lamella or lignocellulosic material which retains the structural integrity of the fibre core. 4,908,099, Cl. 162-21.000.

DeLong, Edward P.: *See—*
DeLong, Edward A.; DeLong, Edward P.; Ritchie, George S.; and Rendall, W. Alan, 4,908,098, Cl. 162-16.000.

Delpato, Ivano, to Minnesota Mining and Manufacturing Company. Silver halide color photographic light-sensitive material. 4,908,302, Cl. 430-544.000.

Delta Conveying Inc.: *See—*
Paulson, Jerome L., 4,907,619, Cl. 137-875.000.

DeLuca, Joan S.: *See—*
Snowden, Gregory O.; DeLuca, Joan S.; and Pace, Gary L., 4,908,523, Cl. 307-43.000.

Denaro, Maurizio: *See—*
Riva, Ernesto; Denaro, Maurizio; Ferrari, Pietro; and Cassani, Giovanni, 4,908,351, Cl. 514-8.000.

Deng, Shiqiao: *See—*
Jiang, Xicheng; Zhang, Changgong; Gao, Yizhi; and Deng, Shiqiao, 4,908,490, Cl. 219-50.000.

Denk, Joseph, to Allied-Signal Inc. Dynamoelectric machine with diamagnetic flux shield. 4,908,347, Cl. 505-1.000.

Derrien, Michel; Ducos, Dominique; and Engerand, Jean-Luc, to Messier-Hispano-Bugatti. Mechanism for controlling a catapult bar. 4,907,761, Cl. 244-102.00R.

Derryberry, Eddie W.: *See—*
Hunley, Eugene C., Jr.; Derryberry, Eddie W.; Wachs, Charles D.; Patton, David A.; and Bennett, Richard L., 4,907,769, Cl. 248-185.000.

De Smedt, Willy P.: *See—*
Vervloet, Ludovicus H.; De Smedt, Willy P.; Vermeulen, Leon L.; and Kok, Piet, 4,908,286, Cl. 430-10.000.

Detroit Innovative Products: *See—*
Moore, Thomas S., 4,907,358, Cl. 37-232.000.

Dettmers, Michael, to Gewerkschaft Eisenhutte Westfalia GmbH. Electro-magnetically operated valve devices. 4,907,779, Cl. 251-129.180.

Deutsche Airbus GmbH: *See—*
Bock, Thomas; and Schwertfeger, Gunther, 4,907,762, Cl. 244-118.100.

Develco, Inc.: *See—*
Rorden, Louis H., 4,908,804, Cl. 367-81.000.

Devlin, Phillip H.: *See—*
Reich, Richard M.; and Devlin, Phillip H., 4,908,602, Cl. 340-514.000.

Dewhirst, Kenneth C.; and Stewart, Thomas G., Jr., to Shell Oil Company. Bis-anthrols and bis-naphthols and diglycidyl ethers thereof. 4,908,424, Cl. 528-97.000.

Diaz, Nestor J.: *See—*
Faiz, Robert L.; Diaz, Nestor J.; and Reinfelder, William C., 4,908,494, Cl. 219-121.720.

Dickinson, Thorn W., to Torrington Company, The. Roller bearing with single flange races. 4,907,898, Cl. 384-564.000.

Dieckow, Werner: *See—*
Waibel, einhard; and Dieckow, Werner, 4,907,882, Cl. 356-251.000.

Diehl GmbH & Co.: *See—*
Westphal, Robert; and Babel, Wolfgang, 4,907,485, Cl. 89-1.110.

Diel, Hartmut; and Hartmann, Hans-Heinrich, to SMS Schloemann-Siemag Aktiengesellschaft. Roll stand with system for axially displaceable rolls. 4,907,439, Cl. 72-247.000.

Diesel Kiki Co., Ltd.: *See—*
Fujii, Kazuo, 4,907,416, Cl. 62-180.000.

Dietzel, Hans-Ulrich; Dolch, Gernot; and Muffke, Walter, to Mannesmann Aktiengesellschaft. System for manipulation of small-diameter pipes and a processing device for vehicular brake, fuel and hydraulic lines. 4,907,326, Cl. 29-33.00T.

Diffracto Ltd.: *See—*
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,907,888, Cl. 356-371.000.

Digital Equipment Corporation: *See—*
Hertrich, Friedrich R., 4,908,826, Cl. 371-40.100.
Leis, Michael; Muchnik, Michael J.; Simmons, Elmer; Brown, Russell; and Rub, Bernardo, 4,908,841, Cl. 375-81.000.
Rub, Bernardo, 4,908,721, Cl. 360-40.000.

Di Giusto, Nevio, to Fiat Auto S.p.A. Catch device with automatic clearance compensation, in particular for vehicle door locks. 4,907,831, Cl. 292-216.000.

Digivision, Inc.: *See—*
DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.

DiLemmo, Marc C., to United States of America, Navy. Multi-channel acoustic simulator. 4,908,800, Cl. 367-13.000.

Dimango Products Corporation: *See—*
Jacob, Keith D., 4,908,604, Cl. 340-539.000.

Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, to Ciba-Geigy Corporation. Substituted propane-phosphonous acid compounds. 4,908,465, Cl. 558-175.000.

Dion, Jean-Paul, to Laboratoire Primatech Inc. Pneumatic nailer. 4,907,730, Cl. 227-8.000.

Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries: *See—*
Sasaki, Takashi; Taniguchi, Hajime; and Kainuma, Keiji, 4,908,311, Cl. 435-101.000.

Ditzig, Albert: *See—*
Sandell, Patrick B.; and Ditzig, Albert, 4,908,817, Cl. 369-291.000.

Dix, Johannes P.: *See—*
Hansen, Guenter; Dix, Johannes P.; Reichelt, Helmut; and Hayashi, Masahiro, 4,908,437, Cl. 534-738.000.

Dixon, Dale D.: *See—*
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,908,480, Cl. 564-409.000.

Doble, Gordon S., to Airfoil Textron Inc. Method of forming articles. 4,907,736, Cl. 228-190.000.

Dr. Wolman GmbH: *See—*
Goettsche, Reimer; and Marx, Hans-Norbert, 4,908,362, Cl. 514-231.200.

Dodd, Ian: *See—*
Robinson, Jeffery H.; and Dodd, Ian, 4,908,204, Cl. 424-94.200.

Doddington, George R.; and Bocchieri, Enrico, to Texas Instruments Incorporated. Speaker independent speech recognition method and system. 4,908,865, Cl. 381-43.000.

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Doherty, Roger D.; and Singh, Rishi P., to SPS Technologies, Inc. Alloys containing gamma prime phase and process for forming same. 4,908,069, Cl. 148-2.000.

Doi, Hideaki: *See—*
Hara, Yasuhiko; Doi, Hideaki; Karasaki, Koichi; and Sase, Akira, 4,908,871, Cl. 382-8.000.

Doi, Masahiro, to Tokyo Electric Co., Ltd. Multiprinting thermal transfer ink ribbon cassette. 4,907,902, Cl. 400-249.000.

Doi, Toshiaki: *See—*
Satoh, Yoshiaki; Nakashima, Yasutaka; Enomoto, Kanehiko; Fujiwara, Atsushi; and Doi, Toshiaki, 4,908,313, Cl. 435-129.000.

Dolan, Jerome; Wanha, Christopher; and Wright, Steven F., to Molex Incorporated. Terminal dereeling apparatus. 4,907,343, Cl. 29-707.000.

Dolch, Gernot: *See—*
Dietzel, Hans-Ulrich; Dolch, Gernot; and Muffke, Walter, 4,907,326, Cl. 29-33.00T.

Dollings, Paul J.: *See—*
Soll, Richard M.; and Dollings, Paul J., 4,908,378, Cl. 514-414.000.

Domroese, Dirk: *See—*
Walde, Michael; Zeidler, Peter; and Domroese, Dirk, 4,907,526, Cl. 118-50.000.

Dona, Carol L. G.: *See—*
Stewart, William E., Jr.; Greer, Michael E.; and Dona, Carol L. G., 4,907,415, Cl. 62-66.000.

Double E, Inc.: *See—*
Heinonen, Robert L., 4,907,650, Cl. 166-80.000.

Dougherty, James A.; Vara, Fulvio J.; and Anderson, Lowell R., to GAF Chemicals Corporation. Divinyl epoxy ethers. 4,908,227, Cl. 427-44.000.

Doutre, Don A.: *See—*
Martin, Jean-Pierre; Dube, Ghyslain; and Doutre, Don A., 4,907,440, Cl. 73-19.000.

Douty, George H.; Fabian, David J.; Kocher, Timothy L.; and Reagan, Joseph R., to AMP Incorporated. Connector with barbed boardlock. 4,907,987, Cl. 439-571.000.

Dow Chemical Company, The: *See—*
Miller, Theodore E., Jr.; Sutton, Tonja R.; and Latta, Charles J., 4,908,168, Cl. 264-40.100.

Dow Corning Corporation: *See—*
Bausch, Gregory G.; Seelbach, Elizabeth A.; and Zombeck, Alan, 4,908,140, Cl. 252-8.600.
Gettings, Richard L.; and White, William C., 4,908,355, Cl. 514-63.000.
Lee, Chi-Long; and Gornowicz, Gerald A., 4,908,208, Cl. 424-409.000.
Lo, Peter Y. K., 4,908,228, Cl. 427-54.100.

Dow Corning Wright: *See—*
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Dowty Electronic Components Limited: *See—*
Hooper, Alan; North, John M.; and Neat, Robin J., 4,908,284, Cl. 429-192.000.

Doyle, Anthony W.: *See—*
Rodriguez, Alan; Rose, John A.; Waller, Clifford B.; and Doyle, Anthony W., 4,907,911, Cl. 405-154.000.

Drabek, Jozef; and Ehrenfreund, Josef, to Ciba-Geigy Corporation. N-phenyl-N-carboxythioureas and their use in the control of pests. 4,908,383, Cl. 514-485.000.

Drake, Lawrence V., to Gyp-Crete Corporation. Heating method and apparatus. 4,907,739, Cl. 237-8.00C.

Dranchak, David W.; Engle, David E.; Hessian, David E.; Knight, Alan D.; Ma, Wai M.; Macek, Thomas G.; and Squires, John J., to International Business Machine Corporation. Electrical connector utilizing flexible electrical circuitry. 4,907,975, Cl. 439-67.000.

Dreckmann, Bruno: *See—*
Bar-Tana, Jacob; Migron, Yoelit; Blum, Jochanan; Dreckmann, Bruno; and Pill, Johannes, 4,908,385, Cl. 514-574.000.

dreEDco, Inc.: *See—*
Hunley, Eugene C., Jr.; Derryberry, Eddie W.; Wachs, Charles D.; Patton, David A.; and Bennett, Richard L., 4,907,769, Cl. 248-185.000.

Drigani, Fausto: *See—*
Poloni, Alfredo; and Drigani, Fausto, 4,907,437, Cl. 72-225.000.

Du Pont-Showa Denko Co., Ltd.: *See—*
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, 4,908,400, Cl. 524-303.000.

Dubbeldam, Gerrit C., to Akzo N.V. Process and apparatus for determining thicknesses of layers. 4,908,508, Cl. 250-225.000.

Dube, Ghyslain: *See—*
Martin, Jean-Pierre; Dube, Ghyslain; and Doutre, Don A., 4,907,440, Cl. 73-19.000.

Ducos, Dominique: *See—*
Derrien, Michel; Ducos, Dominique; and Engerand, Jean-Luc, 4,907,761, Cl. 244-102.00R.

Ducousso, Patrick: *See—*
Poldervaart, Leendert; and Ducousso, Patrick, 4,907,995, Cl. 441-3.000.

Duenkelmann, Dietger, to Foseco International Limited. Method for treating molten metal with a rotary device. 4,908,060, Cl. 75-61.000.

Dufau, Oscar R.: *See—*
Schoepe, Adolf; and Dufau, Oscar R., 4,907,302, Cl. 4-382.000.

Duhl, David N.: *See—*
Chin, Stephen; and Duhl, David N., 4,908,183, Cl. 420-448.000.

Duijvestijn, Adrianus J.: *See—*
Coops, Peter; and Duijvestijn, Adrianus J., 4,908,506, Cl. 250-201.500.

Dullings, Josef; Kloker, Werner; Freitag, Dieter; Lusgen, Holger; Schmid, Helmut; and Winchenbach, Helmut, to Bayer Aktiengesellschaft. Apparatus for the production of low tension moulded parts. 4,908,216, Cl. 425-3.000.

Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, to Societe Anonyme dite : ALSTHOM. Device for ventilating rheostats and/or fluid radiators in a locomotive. 4,907,645, Cl. 165-41.000.

Dumdum, Josefina M.; Mendelson, Leah T.; and Pilling, Richard L., to Union Oil Company of California. Extreme pressure lubricating compositions and method of using same. 4,908,142, Cl. 252-17.000.

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Dunand, Josiane; Arnulf, Paul; and Gasquet, Denis, to Salomon S.A. Apparatus for attaching one end of a ski boot having an attaching element to a ski. 4,907,816, Cl. 280-615.000.

Dunas, Bohdan: *See—*
Hart, David W.; Dunas, Bohdan; and Krulikowski, Joseph, 4,907,524, Cl. 114-356.000.

Duncan IV, Howard C., to Smith Corona Corporation. Auto-realigned print correction. 4,907,900, Cl. 400-63.000.

Dunn, Michael T.: *See*—
Baker, Thomas M.; Dunn, Michael T.; Duven, Jeffrey E.; Hackler, Jim W.; Louden, Peter J.; and Schjoneman, Clifford M., 4,908,618, Cl. 340-945.000.
Duperon, David N.: *See*—
Chapel, Roy W., Jr.; and Duperon, David N., 4,907,341, Cl. 29-612.000.
Du Pont de Nemours, E. I., and Company: *See*—
Barsotti, Robert J.; and Corcoran, Patrick H., 4,908,397, Cl. 523-400.000.
Bolt, John D.; Mahler, Walter; Tebbe, Frederick N.; and Young, Robert J., Jr., 4,908,197, Cl. 423-412.000.
Cocuzza, Anthony J., 4,908,453, Cl. 548-113.000.
Dodia, Harshad R.; and Ostapchenko, George J., 4,908,260, Cl. 428-215.000.
Hung, Ming-Hong, 4,908,461, Cl. 549-455.000.
Malhotra, Satish C., 4,908,410, Cl. 525-276.000.
Mouissie, Bob, 4,908,336, Cl. 439-496.000.
Nebe, William J.; and Osborne, James J., 4,908,296, Cl. 430-281.000.
Pace, Salvatore J., 4,908,112, Cl. 204-299.00R.
Tseng, Chi-Ping, 4,908,056, Cl. 71-90.000.
Durham, Samuel, to Lancer Corporation. Liquid dispenser mixing nozzle. 4,907,725, Cl. 222-129.100.
Dury, Thomas P. Weather insulated tip-up light mounting. 4,907,363, Cl. 43-15.000.
Duven, Jeffrey E.: *See*—
Baker, Thomas M.; Dunn, Michael T.; Duven, Jeffrey E.; Hackler, Jim W.; Louden, Peter J.; and Schjoneman, Clifford M., 4,908,618, Cl. 340-945.000.
Dvorak, Charles J.: *See*—
Dvorak, Jim; and Dvorak, Charles J., 4,907,481, Cl. 83-571.000.
Dvorak, Jim; and Dvorak, Charles J. Powered press with manual punch and die alignment capability. 4,907,481, Cl. 83-571.000.
Dwyer, Stephen J.: *See*—
Ishii, Kaoru; Wilkinson, Thomas F.; Dwyer, Stephen J.; and Cooper, Rick, 4,908,495, Cl. 219-343.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Finsterwalder, Klemens; and Spirres, Jurgen, 4,908,129, Cl. 210-170.000.
Dyer, Nigel P., to Plessey Overseas Limited. Interpolator/decimator filter structure and a notch filter therefor. 4,908,787, Cl. 364-724.100.
E M I Limited: *See*—
Cashen, Ernest R.; and Holder, Peter A. R., 4,908,628, Cl. 342-134.000.
Ealer, James E., to Custon Seamless Guttering. Gutter screen. 4,907,381, Cl. 52-12.000.
Eastman Kodak Company: *See*—
Adams, Michael W.; and Masih, Shabir Z., 4,908,210, Cl. 424-439.000.
DeBoer, Charles; and Long, Michael, 4,908,631, Cl. 346-76.00R.
Fairman, Patricia D., 4,908,641, Cl. 354-275.000.
Holroyd, Bruce A., 4,908,654, Cl. 355-41.000.
Hung, Liang-Sun; and Agostinelli, John A., 4,908,348, Cl. 505-1.000.
Jeffers, Frederick J., 4,908,724, Cl. 360-123.000.
Losee, David L.; Tredwell, Timothy J.; and Boisvert, David M., 4,908,518, Cl. 358-213.230.
Ndebi, Sylvain L., 4,908,670, Cl. 355-284.000.
Resch, William A., III, 4,908,666, Cl. 355-246.000.
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Eaton, Brian M.: *See*—
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Eaton Corporation: *See*—
Hoppie, Lyle O.; and Speranza, Donald, 4,908,553, Cl. 318-382.000.
Patel, Kirit R., 4,907,683, Cl. 192-85.0AA.
Eberhardt, H. Alfred, to Hale Fire Pump Company. Water driven fan system for firefighting. 4,907,654, Cl. 169-70.000.
Echte, Adolf: *See*—
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,908,414, Cl. 525-316.000.
Eckel, Thomas: *See*—
Leitz, Edgar; Eichenauer, Herbert; Ott, Karl-Heinz; Eckel, Thomas; Peters, Horst; and Schoeps, Jochen, 4,908,422, Cl. 527-67.000.
Eckert, Guenter: *See*—
Lach, Dietrich; Eckert, Guenter; Maltry, Werner; and Fischer, Karl, 4,908,239, Cl. 427-389.000.
Eckhardt, Claude: *See*—
Naef, Rudolf; and Eckhardt, Claude, 4,908,040, Cl. 8-137.000.
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Ecolab Inc.: *See*—
Greenwald, Richard B.; and Sze, Isaac S. Y., 4,908,381, Cl. 514-460.000.
Edamura, Koji: *See*—
Amano, Tomoyuki; Kurokawa, Koichi; and Edamura, Koji, 4,908,080, Cl. 149-2.000.
Edelson, Michael W.: *See*—
Masson, Ronald K.; and Edelson, Michael W., 4,908,850, Cl. 379-88.000.
Efco, Inc.: *See*—
Korytko, Myron I., 4,907,436, Cl. 72-184.000.
Egan, Richard G., to Polaroid Corporation. Apparatus for determining angular deviation of an article. 4,907,880, Cl. 356-151.000.
Egashira, Noritaka; and Arita, Hitoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Dye receiving. 4,908,345, Cl. 503-227.000.
Egelhof, Dieter: *See*—
Zag, Heinz; Meinecke, Albrecht; Kolb, Otmar; Mullner, Josef; Csordas, Elemer; and Egelhof, Dieter, 4,908,102, Cl. 162-264.000.
Egner, Walter A.; Schaffer, Ronald R.; Stauffer, Larry R.; and Warner, Gary N., to AMP Incorporated. Tool for assembling optical fiber. 4,907,335, Cl. 29-283.500.
Ehrenfreund, Josef: *See*—
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 4,908,465, Cl. 558-175.000.
Drabek, Jozef; and Ehrenfreund, Josef, 4,908,383, Cl. 514-485.000.
Eichenauer, Herbert: *See*—
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Leitz, Edgar; Eichenauer, Herbert; Ott, Karl-Heinz; Eckel, Thomas; Peters, Horst; and Schoeps, Jochen, 4,908,422, Cl. 527-67.000.
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Allen, Thomas P.; and Eisenbach, Lawrence P., 4,907,355, Cl. 36-131.000.
Eisner, Mark R.; and Becker, Charlton D. Dental syringe shield or prophylactic. 4,907,968, Cl. 433-80.000.
Ekroth, Paul. Shield for building foundation. 4,907,386, Cl. 52-169.140.
Elango, Varadaraj; and Davenport, Kenneth G., to Hoechst Celanese Corporation. Synthesis of 2-(4-hydroxyphenoxy)alkanoic acids. 4,908,476, Cl. 560-144.000.
Electricite De France: *See*—
Arditty, Herve ; Le Boudec, Gilles; Graindorge, Philippe; Gerardin, Jean-Pierre; Lesne, Jean-Louis; and Meyet, Dominique, 4,907,878, Cl. 356-128.000.
Electricite de France (Service National): *See*—
Dalle, Bernard M.; Caillot, Claude; and Legros, Francois A., 4,908,156, Cl. 252-511.000.
Electrosynthesis Company, Inc., The: *See*—
Weinberg, Norman L., 4,908,198, Cl. 423-415.00R.
Elkin, Alfred A., to Plastic Development, Inc. Jewelry clutch. 4,907,425, Cl. 63-12.000.
Elling, David: *See*—
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Ellis, Michael P.: *See*—
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Miles, Alden R.; Schwandt, Theodore F.; Nygard, James C.; Loder, Harry A.; and Emmel, John J., 4,907,825, Cl. 281-51.000.
Emmerich, Friedel; Franitza, Dieter; Hartmann, Heinrich; and Kerk, Klaus, to Rohm GmbH Chemische Fabrik. Plastic crosscurrent heat exchanger. 4,907,648, Cl. 165-166.000.
Emmerich, Wolfgang, to Hacoba-Textilmaschinen GmbH & Co. KG. Method of and apparatus for feeding tacks to shoe lasting machines. 4,907,718, Cl. 221-1.000.
Empire Research and Development Corporation: *See*—
Lynne, Mark, 4,908,130, Cl. 210-172.000.
Enderlin, Robert, to Superba, S.A. Installation for the continuous processing of at least one textile yarn. 4,907,310, Cl. 8-149.200.
Endermann, Rainer: *See*—
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 4,908,366, Cl. 514-252.000.
Endo, Hiroshi: *See*—
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Endowment for Research in Human Biology, Inc.: *See*—
Holmquist, Barton; and Scopes, Robert K., 4,908,187, Cl. 422-81.000.
Engerand, Jean-Luc: *See*—
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England, Richard: *See*—
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Engle, David E.: *See*—
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Engle, Francis E.: *See*—
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Engler, Phillip V.: *See*—
Jefferis, Raymond P., III; Engler, Phillip V.; and Rosenblatt, Aaron A., 4,908,188, Cl. 422-111.000.
Enomoto, Hajime; and Miyamura, Isao, to Fujitsu Limited. Color picture image processing system for separating color picture image into pixels. 4,908,698, Cl. 358-13.000.
Enomoto, Kanehiko: *See*—
Satoh, Yoshiaki; Nakashima, Yasutaka; Enomoto, Kanehiko; Fujiwara, Atsushi; and Doi, Toshiaki, 4,908,313, Cl. 435-129.000.

Ensar Corporation: *See*—
Sarnoff, Norton; Fletcher, Carl; and Chmela, John, 4,908,487, Cl. 219-10.55E.

Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., to ALZA Corporation. Subsaturated transdermal therapeutic system having improved release characteristics. 4,908,027, Cl. 604-890.100.

Envirocycle Pty. Ltd.: *See*—
Chiba, Akira, 4,908,128, Cl. 210-150.000.

Epis S.A.: *See*—
Bar-Tana, Jacob; Migron, Yoelit; Blum, Jochanan; Dreckmann, Bruno; and Pill, Johannes, 4,908,385, Cl. 514-574.000.

Erdmann, Hartmut: *See*—
Ammende, Sonya; Erdmann, Hartmut; Etzkorn, Heinz-Werner; and Zucholl, Klaus, 4,908,118, Cl. 204-424.000.

Ericsson, Sylve J. D.; and Lindstrom, Nils A. E. Stencil frame securing and registering apparatus. 4,907,505, Cl. 101-114.000.

Ermis, Julius C.: *See*—
Lee, Donald V.; and Ermis, Julius C., 4,907,807, Cl. 273-240.000.

Ernst, Richard J.; and Paul, Sigismund, to Illinois Tool Works, Inc. Dispensing device having improved plunger assemblies. 4,907,727, Cl. 222-386.500.

Etablissements Caillau: *See*—
Calmettes, Lionel; and Andre, Michel, 4,907,319, Cl. 24-20.00R.

Etama AG: *See*—
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Etat Francais, represente par le Ministre Delegue des Postes et Telecommunications, (Centre National d'Etudes des Telecommunications): *See*—
Tawfik, Mohamed S.; and Senn, Patrice, 4,908,579, Cl. 328-167.000.

Ethyl Corporation: *See*—
Boldish, Steven I.; and Toor, Irfan A., 4,908,191, Cl. 423-210.000.
Bottelberghe, Scott A., 4,908,463, Cl. 556-179.000.
Laurent, Sebastian M.; and Sanders, Robert N., 4,908,218, Cl. 426-2.000.

Eto, Kunihiko; Takeuchi, Shirou; and Shiba, Yasuo, to Toyoda Koki Kabushiki Kaisha. Torque sensor. 4,907,461, Cl. 73-862.330.

Etoh, Yoshiyuki, to Nissan Motor Company, Ltd. System and method for automatically controlling a vehicle speed to a desired cruising speed. 4,908,764, Cl. 364-426.040.

Etzbach, Karl-Heinz: *See*—
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.

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Ammende, Sonya; Erdmann, Hartmut; Etzkorn, Heinz-Werner; and Zucholl, Klaus, 4,908,118, Cl. 204-424.000.

Evans, Martin B.; and Rothon, Roger N., to Imperial Chemical Industries PLC. Fillers. 4,908,396, Cl. 523-202.000.

Everest, Charles E., to IVAC Corporation. Optical chopper for infrared thermometer. 4,907,895, Cl. 374-130.000.

Ewener, Patrick C.; Bristow, Duncan J.; Armstrong, Scott W.; Dallaire, Louis C.; and Thompson, John A., to Exxon Research and Engineering Company. Method for in-situ repair of solvent dewaxing filter cloths. 4,908,082, Cl. 156-94.000.

Excell Corporation: *See*—
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Extrude Hone Corporation: *See*—
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Exxon Chemical Patents Inc.: *See*—
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Exxon Production Research Company: *See*—
Gunderson, Richard H.; Gardner, Terry N.; and Choate, Thomas G. A., 4,907,914, Cl. 405-224.000.

Exxon Research and Engineering Company: *See*—
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Ewener, Patrick C.; Bristow, Duncan J.; Armstrong, Scott W.; Dallaire, Louis C.; and Thompson, John A., 4,908,082, Cl. 156-94.000.

Ezaki, Joichiro; and Fukuda, Kazumasa, to TDK Corporation. Disk with substrate of alumina silicate resin glass. 4,908,727, Cl. 360-135.000.

Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, to Dainippon Ink and Chemicals, Inc.; and Global Machinery Co., Ltd. Apparatus for manufacturing optical information recording medium. 4,907,956, Cl. 425-110.000.

Ezaki, Yasuo: *See*—
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Fabcon, Inc.: *See*—
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Fabian, David J.: *See*—
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Fairchild Weston Systems, Inc.: *See*—
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Fairman, Patricia D., to Eastman Kodak Company. Photographic film and film cassette. 4,908,641, Cl. 354-275.000.

Faiz, Robert L.; Diaz, Nestor J.; and Reinfelder, William C., to United Technologies Corporation. Method for stabilized cutting of fibrous composite preforms. 4,908,494, Cl. 219-121.720.

Falcione, Ronald J.: *See*—
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Falk Corporation, The: *See*—
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Faller, Alexander, Jr.: *See*—
Faller, Alexander, Sr.; and Faller, Alexander, Jr., 4,907,647, Cl. 165-164.000.

Faller, Alexander, Sr.; and Faller, Alexander, Jr. Heat exchanger. 4,907,647, Cl. 165-164.000.

Fancort Industries, Inc.: *See*—
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Fang, Shou-Mean; and Camphouse, Charles H., to Raychem Corporation. Electrical device comprising conductive polymers. 4,907,340, Cl. 29-610.100.

Fanuc Ltd.: *See*—
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Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, 4,908,555, Cl. 318-567.000.
Toyoda, Kenichi; Toril, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,907,467, Cl. 74-479.000.

Fanuc Ltd: *See*—
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Strom, Lauri A.; Carnall, Edward, Jr.; Ferranti, Steven A.; and Mir, Jose M., 4,908,346, Cl. 505-1.000.

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Williams, John W., 4,907,321, Cl. 24-587.000.
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Bala, Paul F.; Kupcis, Edgars A.; and Fisher, William B., 4,908,619, Cl. 340-966.000.
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Flores, Margarita: *See*—
Staggs, Arnol; and Flores, Margarita, 4,907,660, Cl. 175-320.000.
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Schoepe, Adolf; and Dufau, Oscar R., 4,907,302, Cl. 4-382.000.
FMC Corporation: *See*—
Kressly, Richard H.; Dale, Greogry B.; and Plant, William J., 4,907,933, Cl. 414-334.000.
Lutomski, Kathryn A., 4,908,357, Cl. 514-92.000.
Sogge, John W., 4,907,692, Cl. 198-780.000.
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Focke & Co., (GmbH & Co.): *See*—
Focke, Heinz; and Liedtke, Kurt, 4,907,689, Cl. 198-487.100.
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Panecki, Frank; Satawa, Timothy; and Brank, Leon, 4,908,489, Cl. 219-10.770.
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Crill, Philip D.; and Leliakov, Igor P., 4,908,776, Cl. 364-509.000.
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Gomes, Peter F.; Schisler, Brian W.; and Mooneyham, Gary L., 4,907,695, Cl. 206-386.000.
Milenkovic, Veljko, 4,907,937, Cl. 414-735.000.
Porter, David L., 4,907,553, Cl. 123-400.000.
Yopp, W. Trent, 4,907,452, Cl. 73-457.000.
Ford New Holland, Inc.: *See*—
Pakosh, Daniel, 4,907,402, Cl. 56-14.600.
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Duenkelmann, Dietger, 4,908,060, Cl. 75-61.000.
Foster, Peter M., to George Blair Public Limited Company. Self-adjusting bearing. 4,907,814, Cl. 280-104.000.
Foster, Raymond K. Reciprocating floor conveyor with snap-on floor members. 4,907,691, Cl. 198-750.000.
Fournier, James L., to JLF Designs, Inc. Coil-bound notebook. 4,907,905, Cl. 402-80.00R.
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Kulikowski, Ernest F.; and Fournier, Paul J. E., 4,907,630, Cl. 141-384.000.
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Philibert, Alex C.; Smith, Jack W.; and Fox, James W., 4,908,873, Cl. 382-34.000.
Frame, Robert R.; and Bricker, Jeffery C., to UOP. Process for sweetening a sour hydrocarbon fraction. 4,908,122, Cl. 208-207.000.
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Huebner, Charles F.; and Francis, John E., 4,908,376, Cl. 514-402.000.
Franitza, Dieter: *See*—
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Smolders, Cornelius A.; Franken, Antonius C. M.; and Mulder, Marcellinus H. V., 4,908,235, Cl. 427-243.000.
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Fredricks, Richard E.; and Schmelzer, Michael A., to James River Corporation. Metalized microwave interactive laminate and process for mechanically deactivating a selected area of microwave interactive laminate. 4,908,246, Cl. 428-34.100.
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Henson, James K.; Bourg, Wilfred M., Jr.; and Henson, William D., 4,907,720, Cl. 222-55.000.
Frosch, Franz: *See*—
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Fuchs, Peter, to Nova-Werke AG. Fuel injection device for a diesel engine. 4,907,555, Cl. 123-446.000.
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Akiike, Katsumi; and Ichikawa, Haruo, 4,908,594, Cl. 337-49.000.
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Mura, Shinichiro, 4,907,472, Cl. 475-89.000.
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Fuchizawa, Tetsuro; and Koike, Kazuyuki, 4,908,295, Cl. 430-272.000.
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Ishikawa, Hiromi; and Noguchi, Masaru, 4,908,511, Cl. 250-235.000.
Katoh, Kazunobu; Takagi, Yoshihiro; Kameoka, Kimitaka; Miyata, Junji; and Ukai, Toshinao, 4,908,293, Cl. 430-264.000.
Kogane, Mikio, 4,908,657, Cl. 355-75.000.
Miyasaka, Tsutomu; Tani, Tadaaki; and Sugimoto, Tadao, 4,908,303, Cl. 430-569.000.
Saotome, Shigeru; and Ishida, Masamitsu, 4,908,520, Cl. 250-327.200.
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Fujimoto, Hideo: *See*—
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,908,184, Cl. 420-534.000.

Fujimoto, Takayuki: *See*—
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Fujimura, Itaru: *See*—
Ide, Yukio; Ohshima, Kohichi; Fujimura, Itaru; and Kageyama, Yoshiyuki, 4,908,292, Cl. 430-128.000.

Fujinawa, Takeshi: *See*—
Shoda, Isao; Fujinawa, Takeshi; and Yazawa, Toshikuni, 4,907,371, Cl. 51-33.00R.

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Fujisawa, Akihiko, to Oki Electric Industry Co., Ltd. Analog-to-digital and digital-to-analog converter. 4,908,620, Cl. 341-108.000.

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Ishihara, Shousaku; Yokono, Hitoshi; Fujita, Tsuyoshi; Satoh, Ryohei; and Wasai, Kiyotaka, 4,908,696, Cl. 357-81.000.

Fujita, Yoshihiro: *See*—
Komatsuzaki, Hiroshi; Asano, Seiji; and Fujita, Yoshihiro, 4,908,642, Cl. 354-400.000.

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Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, 4,907,956, Cl. 425-110.000.

Fujitani, Yuuki; and Kawakami, Kouji, to Aisin Seiki Kabushiki Kaisha. Differential mechanism of a four-wheel driving apparatus for vehicles. 4,907,473, Cl. 475-250.000.

Fujitsu Limited: *See*—
Enomoto, Hajime; and Miyamura, Isao, 4,908,698, Cl. 358-13.000.
Hanawa, Tetsuya, 4,908,848, Cl. 379-63.000.
Hashimoto, Shuichi, 4,908,561, Cl. 318-677.000.
Hidaka, Norio; Yamamura, Shigeyuki; and Fukuta, Masumi, 4,908,694, Cl. 357-74.000.
Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, 4,908,862, Cl. 380-28.000.
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Satoh, Yoshiaki; Nakashima, Yasutaka; Enomoto, Kanehiko; Fujiwara, Atsushi; and Doi, Toshiaki, 4,908,313, Cl. 435-129.000.

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Fujiyama, Toshiki, to Mitsubishi Denki K.K. Shift control signal generation circuit for floating-point arithmetic operation. 4,908,788, Cl. 364-748.000.

Fukano, Masahiko; and Takemoto, Mitsutoshi, to Mita Industrial Co., Ltd. Image forming apparatus. 4,908,674, Cl. 355-318.000.

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Kagatsume, Satoshi; and Fukasawa, Kazuo, 4,908,095, Cl. 156-643.000.

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Fukuda, Kazumasa: *See*—
Ezaki, Joichiro; and Fukuda, Kazumasa, 4,908,727, Cl. 360-135.000.

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Hidaka, Norio; Yamamura, Shigeyuki; and Fukuta, Masumi, 4,908,694, Cl. 357-74.000.

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Paul, Kermit D., 4,907,892, Cl. 366-101.000.

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Morimoto, Hideaki; and Funayama, Kiyoshi, 4,908,839, Cl. 375-40.000.

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Harvey, Donald W.; Fung, Bing-Fai; and Bacha, Donald J., 4,908,802, Cl. 367-149.000.

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Wells, Gordon K.; and Funk, Bradley D., 4,908,596, Cl. 337-354.000.

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G. Rodenstock Instrumente GmbH: *See*—
Schirmer, K. E.; and Reis, Werner, 4,907,872, Cl. 351-160.00R.

G. Siempelkamp GmbH & Co.: *See*—
Pesch, Jurgen; and Konig, 4,907,938, Cl. 414-749.000.

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Bergsma, Rudolph, 4,907,616, Cl. 137-38.000.

Gabis, Victor; and Gailly, Christian, to Centre National De La Recherche Scientifique (CNRS). Chill moulding process, particularly for metals, and apparatus and mold for use therein. 4,907,642, Cl. 164-457.000.

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Gailly, Christian: *See*—
Gabis, Victor; and Gailly, Christian, 4,907,642, Cl. 164-457.000.

Gaiser, Robert F.: *See*—
Crumb, Donald A.; Gaiser, Robert F.; and Steer, John E., 4,908,522, Cl. 303-9.720.

Galic, George J.; and Maus, Steven M. Method for plasticating using reciprocating-screw having a melt channel and solids channel. 4,908,169, Cl. 264-40.200.

Gall, Arthur; Kuetterer, Gerhard; and Richter, Helmut, to Siemens Aktiengesellschaft. Light distributor for an X-ray diagnostics installation. 4,908,843, Cl. 378-99.000.

Gallo, Bruce M.: *See*—
Hannon, Charles J.; and Gallo, Bruce M., 4,908,847, Cl. 379-61.000.

Gallucci, Steven. Glove. 4,907,297, Cl. 2-163.000.

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Gandionco, Isidro: *See*—
Christain, Jeffrey J.; Gould, Ross; and Gandionco, Isidro, 4,907,332, Cl. 29-237.000.

Gao, Yizhi: *See*—
Jiang, Xicheng; Zhang, Changgong; Gao, Yizhi; and Deng, Shiqiao, 4,908,490, Cl. 219-50.000.

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Stangl, Gerald A.; Lee, Douglas W.; and Wilson, Dirk A., 4,907,658, Cl. 175-19.000.

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Gasquet, Denis: *See*—
Dunand, Josiane; Arnulf, Paul; and Gasquet, Denis, 4,907,816, Cl. 280-615.000.

Gates, James P.: *See*—
Davis, Terry W.; and Gates, James P., 4,907,506, Cl. 101-115.000.

Gates, John, to TIW Systems, Inc. Forward error correction system. 4,908,827, Cl. 371-43.000.

Gatin, Walter L. Ball throwing apparatus. 4,907,802, Cl. 273-26.00R.

Gatlin, Larry A.: *See*—
Bennett, William F.; Builder, Stuart E.; and Gatlin, Larry A., 4,908,205, Cl. 424-94.640.

Gatz, Michael F. Resilient paint can accessory. 4,907,714, Cl. 220-90.000.

Gaudronneau, Yann, to Thomson Composants Militaires Et Spatiaux. Device to detect the functioning of the read system of an EPROM or EEPROM memory cell. 4,908,799, Cl. 365-241.000.

Gautier, Jean-Pierre; Perez, Miguel; and Verbo, Pedro, to Bendix France. Brake booster with retaining key and ring. 4,907,494, Cl. 91-369.300.

Geballe, Theodore H.: *See*—
Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, 4,907,731, Cl. 228-2.500.

Gebert, Ulrich: *See—*
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,908,364, Cl. 514-243.000.

Geberth, John D., Jr. Totally enclosed electric motor. 4,908,538, Cl. 310-59.000.

Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG: *See—*
Reuter, Alfred, 4,907,632, Cl. 144-356.000.

Gelfer, George G.; and Hart, William G., Jr., to Pitney Bowes Inc. Inserter based mail manifesting system. 4,908,768, Cl. 364-464.030.

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Bennett, William F.; Builder, Stuart E.; and Gatlin, Larry A., 4,908,205, Cl. 424-94.640.

General Dynamics, Pomona Division: *See—*
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General Electric Company: *See—*
Bulman, Melvin J., 4,907,511, Cl. 102-440.000.
Castonguay, Roger N.; Palmieri, Joseph M.; and Scott, Graham A., 4,907,342, Cl. 29-622.000.
Ciokajlo, John J.; and Vogt, Daniel S., 4,907,946, Cl. 415-209.300.
Csillag, Frank J.; and Bovenkerk, Harold P., 4,907,377, Cl. 51-309.000.
Hilakos, William; and Patterson, Dwight J., 4,907,527, Cl. 118-67.000.
Holub, Fred F., 4,908,418, Cl. 525-425.000.
Holub, Fred F.; and Schlich, William R., 4,908,419, Cl. 525-425.000.
Kroger, Gerard P.; Peck, Robert A.; and Kirkpatrick, Ralph A., 4,907,944, Cl. 415-65.000.
Mayer, Robert E., 4,907,486, Cl. 89-7.000.
Temple, Victor A. K., 4,908,687, Cl. 357-38.000.
Thornton, Roy F., 4,907,338, Cl. 29-599.000.
Webster, Harold F., 4,908,736, Cl. 361-408.000.

General Foods Corporation: *See—*
Spotholz, Clifford H.; and Scarsella, Edward L., 4,907,719, Cl. 222-1.000.

General Kap Corporation: *See—*
Csaszar, Edward F., 4,907,708, Cl. 215-252.000.

General Petrochemical Industries, Limited: *See—*
Narang, Subhash C.; and Ventura, Susanna, 4,908,442, Cl. 540-145.000.

Genex Corporation: *See—*
Pantoliano, Michael W.; and Ladner, Robert C., 4,908,773, Cl. 364-496.000.

Geng, E. David: *See—*
Konrad, Kenneth F.; and Geng, E. David, 4,907,698, Cl. 206-611.000.

Genuit, Gerard: *See—*
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,907,645, Cl. 165-41.000.

George Blair Public Limited Company: *See—*
Foster, Peter M., 4,907,814, Cl. 280-104.000.

Geosource, Inc.: *See—*
Harvey, Donald W.; Fung, Bing-Fai; and Bacha, Donald J., 4,908,802, Cl. 367-149.000.

Gerardin, Jean-Pierre: *See—*
Arditty, Herve ; Le Boudec, Gilles; Graindorge, Philippe; Gerardin, Jean-Pierre; Lesne, Jean-Louis; and Meyet, Dominique, 4,907,878, Cl. 356-128.000.

Gerhard, Helmut, to Siegenia-Frank KG. Adjustable rod joint. 4,907,908, Cl. 403-393.000.

Gerrard, Donald L.: *See—*
Bowley, Heather J.; and Gerrard, Donald L., 4,907,875, Cl. 356-30.000.

Gervais, Christian, to Rhone-Poulenc Sante. Process for preparing N-methyl derivatives of lysergol and 10α-methoxylumilysergol. 4,908,449, Cl. 546-67.000.

Gettings, Richard L.; and White, William C., to Dow Corning Corporation. Skin treatment method. 4,908,355, Cl. 514-63.000.

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Dettmers, Michael, 4,907,779, Cl. 251-129.180.

Gezari, Daniel Y.: *See—*
Gezari, Walter; and Gezari, Daniel Y., 4,907,797, Cl. 272-129.000.

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Ghiraldi, Alberto. Method and container device for the protection and thermal conditioning of apparatus, in particular electronic apparatus generating heat. 4,907,644, Cl. 165-32.000.

Giachino, Joseph M.: *See—*
Gardner, Robert C.; Giachino, Joseph M.; Horn, William F.; Rhoades, Mark K.; Wells, Marvin D.; and Yockey, Steve J., 4,907,748, Cl. 239-584.000.

Giannini, Suzanne H.: *See—*
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Gianturco, Cesare, to Cook Incorporated. Method of making an endovascular stent and delivery system. 4,907,336, Cl. 29-515.000.

Giblet, Allen L. Vehicle mountable luggage carrier assembly. 4,907,728, Cl. 224-42.03A.

Gibson, Richard L.: *See—*
Alger, Andrew L.; Polhemus, Marlan H.; Cheris, Albert B.; and Gibson, Richard L., 4,907,703, Cl. 211-10.000.

Gil, Yoram. Propulsion aids for attachment to a swimmer's feet. 4,907,519, Cl. 441-61.000.

Gill, Ronald W. A.: *See—*
Woodhead, Alfred W.; Gill, Ronald W. A.; Knapp, Alan G.; Lamport, Daphne L.; and Washington, Derek, 4,908,545, Cl. 313-103.0CM.

Gilliland, Richard G.: *See—*
Byers, William N.; and Gilliland, Richard G., 4,908,577, Cl. 324-207.200.

Ginsberg, Jay. Shoe lace replacing and shoe fastening device. 4,907,352, Cl. 36-50.000.

Ginter, L. James; and Kurz, K. Thomas, to Cruisers, Incorporated. Stern platform ladder. 4,907,673, Cl. 182-81.000.

Giorgio, Paul J. Switch display encoder apparatus. 4,908,791, Cl. 364-900.000.

Giuliani, David; and Gutcheck, Robert A., to Abbott Laboratories. Optical fiber distribution system for an optical fiber sensor. 4,907,857, Cl. 350-96.290.

Givaudan Corporation: *See—*
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Givens, Wyatt W., to Mobil Oil Corporation. Apparatus for measuring resistivity of porous rock. 4,907,448, Cl. 73-153.000.

Glaenzer-Spicer: *See—*
Van Dest, Jean C.; Guimbretiere, Pierre; Poulain, Bernard; and Verbrugge, Francois, 4,908,005, Cl. 464-111.000.

Glasstech, Inc.: *See—*
Nicholson, Robert D.; Kaake, Steven A. F.; and Smith, Robert F., 4,907,915, Cl. 405-229.000.

Glaxo Group Limited: *See—*
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; Campbell, Ian B.; Middlemiss, David; and Willbe, Charles, 4,908,386, Cl. 514-605.000.

Global Machinery Co., Ltd.: *See—*
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Globig, Michael A.; Johnson, Michael A.; and Wyeth, Richard W., to United States of America, Energy. Heterodyne laser diagnostic system. 4,907,885, Cl. 356-349.000.

Gobbi, Ronald R. Self guiding adjustable snap on plastic cleat and bicycle pedal. 4,907,469, Cl. 74-594.600.

Godbey, Susan E.: *See—*
Stanley, Ann E.; and Godbey, Susan E., 4,908,110, Cl. 204-157.610.

Goertz, Hans-Helmut; Straub, Ferdinand; Vogel, Friedrich; Frosch, Franz; Naegele, Paul; and Raubenheimer, Hans-Juergen, to BASF Aktiengesellschaft. Preparation of copolymers of monoalkyl maleates and vinyl alkyl ethers. 4,908,413, Cl. 525-304.000.

Goettsche, Reimer; and Marx, Hans-Norbert, to Dr. Wolman GmbH. Salt of a substituted morpholine with fluoboric acid, fungicidal composition and use. 4,908,362, Cl. 514-231.200.

Goetz, Philip J.: *See—*
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Goldbach, Gary O.; and O'Hagan, Michael A., to Combustion Power Company. Method and apparatus for removing foreign objects from fluid bed systems. 4,908,124, Cl. 209-139.100.

Goldfein, Nathan L., to International Transquip Industries. Vehicle air brake system and valves for it. 4,907,842, Cl. 303-13.000.

Goldstein, Yeshayahu Shyke A.: *See—*
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Goldwasser, Dorothy: *See—*
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Goldwasser, Eric; and Goldwasser, Dorothy. Speech transcribing system. 4,908,866, Cl. 381-44.000.

Golinelli, Guido: *See—*
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Gomes, Peter F.; Schisler, Brian W.; and Mooneyham, Gary L., to Ford Motor Company. Robotic pallet/container. 4,907,695, Cl. 206-386.000.

Gons, Stephen E.: *See—*
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Gonzenbach, Hans-Ulrich, to Givaudan Corporation. Bicyclic aldehydes and fragrance compositions containing same. 4,908,349, Cl. 512-26.000.

Good, Clive R.: *See—*
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Good, Michael: *See—*
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Goodman, James A., to Prototype Equipment Corp. Shelf packer. 4,907,397, Cl. 53-443.000.

Goodrich, Gary B.; and Belani, Jadish G., to National Semiconductor Corporation. Low-cost semiconductor device package process. 4,908,086, Cl. 156-181.000.

Gornowicz, Gerald A.: *See—*
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Goto, Shiro: *See*—
Ishikawa, Kazunori; Taniguchi, Takuji; Tsukamoto, Kazumasa; and Goto, Shiro, 4,908,255, Cl. 428-131.000.
Gotō, Yasuyuki, to Chisso Corporation. Cyclohexane derivative. 4,908,152, Cl. 252-299.630.
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, to Hitachi Maxell, Ltd.; and Hitachi, Ltd. Optical recording medium and production method thereof. 4,908,250, Cl. 428-64.000.
Gotoh, Toshihiro: *See*—
Arai, Masakazu; Endo, Hiroshi; Gotoh, Toshihiro; Yagi, Toshio; Tanaka, Masanori; Saito, Masanori; and Mathuno, Shigeki, 4,908,393, Cl. 521-60.000.
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Goure, William F.: *See*—
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Govil, Sharad K.; and Kohlman, Paul, to Schering Corporation. Transdermal delivery of nicotine. 4,908,213, Cl. 424-447.000.
Graaskamp, William J.: *See*—
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Grass Valley Group, Inc., The: *See*—
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Graton, Michel; Courcol, Michel-Andre; and Thiebaut, Jacques, to VALEO. Torsion damping device with movement transmitting element. 4,908,004, Cl. 464-68.000.
Green, Derek J.: *See*—
Carter, David G.; Green, Derek J.; and Clark, Anthony J., 4,907,822, Cl. 281-15.100.
Green, Ian M., to Thorn EMI plc. Display device. 4,908,613, Cl. 340-719.000.
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Greenwald, Richard B.; and Sze, Isaac S. Y., to Ecolab Inc. Antimicrobial film-forming compositions. 4,908,381, Cl. 514-460.000.
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Gregg, David P.; Shu, Stephen K.; and Wilson, Kitchener C. Optical recording system utilizing proportional real-time feedback control of recording beam intensity. 4,908,815, Cl. 369-116.000.
Gregory, Peter, to Imperial Chemical Industries PLC. Aromatic disazo compounds having strong infra-red absorption. 4,908,435, Cl. 534-761.000.
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Grellner, Wolfgang: *See*—
Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred, 4,908,173, Cl. 264-63.000.
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Grohmann, Paul, to Messer Griesheim GmbH. Process and device for the longitudinal cutting of continuous castings. 4,908,070, Cl. 148-9.00R.
Grosbois, Jean: *See*—
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Grosso, Paul V.; Morgan, Michael J.; Wing, Feagin A., Jr.; and Burt, Williard F., to Olin Corporation. Color-self-developing, microcapsular toner particles. 4,908,301, Cl. 430-45.000.
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Guion, Christian, to Schlumberger Industries. Revalidatable service supplying system. 4,908,499, Cl. 235-380.000.
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Gungi, Hiroyoshi: *See*—
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Gunji, Kouichi, to Konica Corporation. Toner density control and a binding margin by index board image. 4,908,663, Cl. 355-218.000.
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Haagens, Randolph B.; and Keaveny, Thomas A., to Hewlett-Packard Company. Hybrid communications link adapter incorporating input-/output and data communications technology. 4,908,823, Cl. 370-85.100.

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Hackemesser, Larry G.; and Lankford, Bradley L., to M. W. Kellogg Company, The. Flexible feed pyrolysis process. 4,908,121, Cl. 208-85.000.
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Hagerty, James J.; and Danziger, Leslie A., to John E. Fetzer Foundation. Macro-gradient optical density transmissive light concentrators, lenses and compound lenses of large geometry. 4,907,864, Cl. 350-413.000.
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Hagiwara, Yoshihiko; and Ooshima, Katsumi, to Topre Corporation. Pedal effort-reduction apparatus. 4,907,468, Cl. 74-512.000.
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Togawa, Fumio; Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Ueda, Toru, 4,908,864, Cl. 381-43.000.
Hakky, Said I. Method of treatment of a person having a compromised human immune system. 4,908,207, Cl. 424-195.100.
Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred, 4,907,654, Cl. 169-70.000.
Hall, Christopher W. G., to Pilkington PLC. Impact-resistant laminate. 4,908,083, Cl. 156-99.000.
Hall, Joseph S. Survival craft. 4,907,997, Cl. 114-345.000.
Hall, Kenneth, to Canstar Sports Group Inc. Ice hockey skate blade. 4,907,813, Cl. 280-11.180.
Hall, Roger G.: *See*—
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 4,908,465, Cl. 558-175.000.
Haller, Ingo: *See*—
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 4,908,366, Cl. 514-252.000.
Halter, Todd D.: *See*—
Marx, Martin J.; Harper, Mark A.; and Halter, Todd D., 4,907,444, Cl. 73-60.100.
Hamamatsu Photonics Kabushiki Kaisha: *See*—
Suzuki, Susumu; Yagi, Sumio; Hakamata, Naotoshi; and Ozaki, Takeo, 4,907,876, Cl. 356-41.000.
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Hamanishi, Kohei: *See*—
Kanno, Toshiyuki; Watanabe, Hitoshi; and Hamanishi, Kohei, 4,908,294, Cl. 430-270.000.
Hamatsu, Masahiro: *See*—
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Hamon, Gilles: *See*—
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 4,908,367, Cl. 514-253.000.
Hampejs, Karl, to SIG Schweizerische Industrie-Gesellschaft. Apertured valve disposed in hollow piston rod of follower-type motor. 4,907,492, Cl. 91-49.000.
Hamzik, Richard R.: *See*—
Lund, Clarence A.; and Hamzik, Richard R., 4,908,688, Cl. 357-41.000.
Hanawa, Tetsuya, to Fujitsu Limited. Apparatus for controlling calls in a mobile communication system. 4,908,848, Cl. 379-63.000.
Haneda, Satoshi: *See*—
Fukuchi, Masakazu; and Haneda, Satoshi, 4,908,287, Cl. 430-58.000.
Haner, Robert M.: *See*—
Pratt, Wilson N.; and Haner, Robert M., 4,907,733, Cl. 228-122.000.
Hannon, Charles J.; and Gallo, Bruce M., to Telcor, Inc. Adaptor set for converting standard telephone into cordless telephone. 4,908,847, Cl. 379-61.000.
Hanschen, Thomas P.: *See*—
Reed, John F.; Meyer, Daniel E.; and Hanschen, Thomas P., 4,908,263, Cl. 428-286.000.
Hansen, Christopher R.: *See*—
Chaplin, Daniel J.; Trethewey, Paul M.; Hansen, Christopher R.; and Angell, R. Barry, 4,908,699, Cl. 358-22.000.
Hansen, Guenter; Dix, Johannes P.; Reichelt, Helmut; and Hayashi, Masahiro, to BASF Aktiengesellschaft. Thien-2-one compounds with an alkylidene or imino group in the 5-position of the ring. 4,908,437, Cl. 534-738.000.
Hansen, Guenter: *See*—
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.
Hantschk, Gunther, to Netzsch-Mohnopumpen GmbH. Pin joint for eccentric worm pumps. 4,907,906, Cl. 403-154.000.
Hanyu, Susumu; and Koike, Mikio, to Janome Sewing Machine. Sewing machine with a device for guiding an upper thread. 4,907,517, Cl. 112-302.000.
Hara, Hiromu: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, 4,908,368, Cl. 514-256.000.
Hara, Hiroshi; Sonobe, Hiraku; Shihou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, to Canon Kabushiki Kaisha. Optical pickup apparatus. 4,907,858, Cl. 350-286.000.
Hara, Isao: *See*—
Takaki, Usaji; Aoki, Shinobu; Yamamoto, Yoshihiro; and Hara, Isao, 4,908,472, Cl. 560-104.000.
Hara, Yasuhiko; Doi, Hideaki; Karasaki, Koichi; and Sase, Akira, to Hitachi, Ltd. Pattern inspection system. 4,908,871, Cl. 382-8.000.
Harada, Masahiro; Matsumura, Makoto; Kino, Toru; Iwamoto, Akira; and Momose, Yoshiaki, to Mitsubishi Gas Chemical Company, Inc. Gas-barrier multilayered structure. 4,908,272, Cl. 428-412.000.
Haraguchi, Satoru: *See*—
Shiomi, Yutaka; Kamio, Kunimasa; Haraguchi, Satoru; and Naitoh, Shigeki, 4,908,417, Cl. 525-422.000.
Harbor Branch Oceanographic Institution, Inc.: *See*—
Rinehart, Kenneth L.; and Patil, Ashok D., 4,908,445, Cl. 540-527.000.
Hardinge Brothers, Inc.: *See*—
Brown, Ivan R., deceased; Eaton, Brian M.; and Carlyle, Robert B., 4,907,478, Cl. 82-149.000.
Harper, Clair, to Cardiac Control Systems, Inc. Self-sealing connector for electrical leads for use in wet environments. 4,907,592, Cl. 128-419.00P.
Harper, Mark A.: *See*—
Marx, Martin J.; Harper, Mark A.; and Halter, Todd D., 4,907,444, Cl. 73-60.100.
Harris Corporation: *See*—
Matlock, Dyer A.; Lichtel, Richard L., Jr.; and Pearce, Lawrence G., 4,908,683, Cl. 357-23.110.
Mefford, Joseph P., 4,908,526, Cl. 307-263.000.
Tesch, Bruce J., 4,908,566, Cl. 323-280.000.
Harris, Elgie, II: *See*—
Hebert, Douglas W.; and Harris, Elgie, II, 4,907,953, Cl. 417-444.000.
Harris, Ian R.: *See*—
Breen, Brian E.; and Harris, Ian R., 4,908,599, Cl. 338-22.00R.
Harris, James E.: *See*—
Robeson, Lloyd M.; Winslow, Paul A.; Matzner, Markus; Harris, James E.; and Maresca, Louis M., 4,908,425, Cl. 528-125.000.
Harris, Kenneth J., to Conserve, Inc. Heat pump. 4,907,738, Cl. 237-2.00B.
Harris, Kenneth R., to Imtran Industries, Inc. Apparatus for repositioning containers. 4,907,504, Cl. 101-40.100.
Harris, Kurt N., to Owens-Illinois Closure Inc. Stripping dispenser package for viscous products. 4,907,726, Cl. 222-145.000.
Harris, Peter J. F.: *See*—
Harrison, Philip G.; and Harris, Peter J. F., 4,908,192, Cl. 423-213.200.
Harris, Robert: *See*—
Bromley, Eric; and Harris, Robert, 4,908,612, Cl. 340-706.000.
Harris, Stephen J.; MacManus, Maureen G.; and Guthrie, John, to Loctite (Ireland) Ltd. Encapsulating compositions. 4,908,399, Cl. 524-243.000.
Harrison, Philip G.; and Harris, Peter J. F., to TI Corporate Services Limited. Vehicle exhaust gas systems. 4,908,192, Cl. 423-213.200.
Hart, David W.; Dunas, Bohdan; and Krulikowski, Joseph, to Special Projects Research Corporation. Method and device for controlling strain and/or deflection in superstructures. 4,907,524, Cl. 114-356.000.
Hart Enterprises, Inc.: *See*—
Taylor, Glenn N., 4,907,599, Cl. 128-754.000.
Hart, William G., Jr.: *See*—
Gelfer, George G.; and Hart, William G., Jr., 4,908,768, Cl. 364-464.030.

Hartman, Philip L. Pressure grouted pier and pier inserting tool. 4,907,916, Cl. 405-236.000.

Hartmann, Hans-Heinrich: *See*—
Diel, Hartmut; and Hartmann, Hans-Heinrich, 4,907,439, Cl. 72-247.000.

Hartmana, Heinrich: *See*—
Emmerich, Friedel; Franitza, Dieter; Hartmann, Heinrich; and Kerk, Klaus, 4,907,648, Cl. 165-166.000.

Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, to BASF Aktiengesellschaft. Removal of organic iodine compounds from carbonylation products of methanol methyl acetate and dimethyl ether. 4,908,477, Cl. 560-248.000.

Hartner, Ralph D. Field marking of electrical wiring. 4,908,177, Cl. 264-132.000.

Harvey, Donald W.; Fung, Bing-Fai; and Bacha, Donald J., to Geosource, Inc. Apparatus for fiber optic seismic exploration system. 4,908,802, Cl. 367-149.000.

Hase, Gary, to H & R Industries, Inc. Insulated refrigerated storage container. 4,907,423, Cl. 62-384.000.

Hasegawa, Hiroshi: *See*—
Takatsuka, Jitsuho, 4,908,605, Cl. 340-542.000.

Hasegawa, Shigekazu: *See*—
Machida, Satoshi; Hasegawa, Shigekazu; Ota, Yoshimi; and Okamoto, Muneji, 4,907,465, Cl. 74-89.200.

Hasegawa, Shinji, to Kabushiki Kaisha Toshiba. Apparatus for detecting error of detector. 4,908,844, Cl. 378-209.000.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,908,849, Cl. 379-67.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Telephone answering device capable of repeatedly playing back outgoing message. 4,908,849, Cl. 379-67.000.

Hashimoto, Osamu: *See*—
Sato, Susumu; Hashimoto, Osamu; Irie, Toshio; and Matsuno, Nobuo, 4,908,073, Cl. 148-12.00C.

Hashimoto, Shuichi, to Fujitsu Limited. Servo amplifier circuit. 4,908,561, Cl. 318-677.000.

Hata, Masayuki; and Nakagawa, Hiromasa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device with high reliability wiring layers. 4,908,690, Cl. 357-68.000.

Hata, Yoshiaki: *See*—
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,908,650, Cl. 354-412.000.

Hatanaka, Masayuki: *See*—
Kurita, Atsushi; Hatanaka, Masayuki; and Huy, Sam, 4,908,395, Cl. 522-42.000.

Hatfield, Gretchen R.: *See*—
Caravajal, Gregory S.; and Hatfield, Gretchen R., 4,908,148, Cl. 252-135.000.

Hattori, Jun: *See*—
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,907,866, Cl. 350-426.000.

Hattori, Katsuhide: *See*—
Tasaki, Yoji; Tanaka, Akihiro; Kurokawa, Koichi; Hattori, Katsuhide; and Amano, Motoyuki, 4,908,079, Cl. 149-2.000.

Hattori, Masayuki: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,908,271, Cl. 428-402.220.

Hauch, David A., to MTS Systems Corporation. Hydraulic press having integrated column clamps and actuators. 4,907,959, Cl. 425-406.000.

Haufe, Paul J. M. Device for electroclimatization of the inner chamber of a motor vehicle. 4,907,498, Cl. 98-2.110.

Hawkins, Lendsay W. Combined hassock, nutcracker and disposal unit. 4,907,840, Cl. 297-193.000.

Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Takagi, Osamu, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus having upper and lower sections separable from each other at medium exposing path. 4,908,652, Cl. 335-27.000.

Hayakawa, Kiyoharu: *See*—
Sago, Akira; Ueda, Masashi; Takagi, Osamu; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,908,653, Cl. 355-27.000.

Hayakawa, Masakatu: *See*—
Akao, Shigeaki; Hayakawa, Masakatu; and Kawamura, Mitsuyoshi, 4,907,330, Cl. 123-90.510.

Hayakawa, Tomohiko: *See*—
Honda, Sueaki; Hayashi, Mitsuji; Kiyono, Yasuhiro; Niwa, Takashi; and Hayakawa, Tomohiko, 4,908,485, Cl. 200-462.000.

Hayama, Masato: *See*—
Inoue, Kazuo; Yano, Shunji; Yamaji, Hideo; Hirayama, Takayuki; and Hayama, Masato, 4,907,952, Cl. 417-407.000.

Hayashi, Masaharu; and Tanaka, Seiya, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling device. 4,907,682, Cl. 192-58.00B.

Hayashi, Masahiro: *See*—
Hansen, Guenter; Dix, Johannes P.; Reichelt, Helmut; and Hayashi, Masahiro, 4,908,437, Cl. 534-738.000.

Hayashi, Mitsuji: *See*—
Honda, Sueaki; Hayashi, Mitsuji; Kiyono, Yasuhiro; Niwa, Takashi; and Hayakawa, Tomohiko, 4,908,485, Cl. 200-462.000.

Hayashi, Motohiko: *See*—
Kotani, Matahira; Hachinoda, Masayuki; Matsuda, Toshihiro; Nakajiri, Takashi; and Hayashi, Motohiko, 4,908,851, Cl. 379-100.000.

Hazony, Dov; and Berris, Richard E., Jr., to J. W. Harley, Inc. Ultrasonic transducer. 4,907,454, Cl. 73-597.000.

Head, Robert A.; and Johnson, Steven, to Imperial Chemical Industries PLC. Coating compositions. 4,908,297, Cl. 430-284.000.

Hebert, Douglas W.; and Harris, Elgie, II. Locking gas equalizer assembly. 4,907,953, Cl. 417-444.000.

Hedemora AB: *See*—
Frisk, Edvin; Frisk, Per-Olof; and Lindahl, Arne, 4,908,101, Cl. 162-261.000.

Hedman, Dean L. R. Weedless, multi-depth sinking and top water fish lures. 4,907,364, Cl. 43-42.390.

Hefferon, George J.; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., to International Business Machines Corporation. Method of creating patterned multilayer films for use in production of semiconductor circuits and systems. 4,908,298, Cl. 430-313.000.

Heguri, Masatoshi: *See*—
Iimura, Mituo; Heguri, Masatoshi; Gunji, Satoru; and Ikehara, Kenji, 4,908,251, Cl. 428-68.000.

Heider, John E.: *See*—
Kinlen, Patrick J.; and Heider, John E., 4,908,117, Cl. 204-415.000.

Heinonen, Robert L., to Double E, Inc. Wellhead with safety valve for pumping well. 4,907,650, Cl. 166-80.000.

Heinrich, Juergen; Krauth, Axel; Victor, Karl-Heinz; and Peeken, Heinz, to Hoechst Ceramtec Aktiengesellschaft; and Pacific Wietz GmbH & Co. KG. Process for producing a sliding body. 4,908,081, Cl. 156-89.000.

Hellon, Keith, to MacLean-Fogg Company. Backward starting locknut. 4,907,924, Cl. 411-303.000.

Helmets Limited: *See*—
Dampney, Ian T.; and Good, Michael, 4,907,300, Cl. 2-424.000.

Helmle, Fred J.; and Helmle, Scott M., to Little Suamico Products Inc. Multiple bin cow feeder. 4,907,538, Cl. 119-51.010.

Helmle, Scott M.: *See*—
Helmle, Fred J.; and Helmle, Scott M., 4,907,538, Cl. 119-51.010.

Hemmann, Siglinde: *See*—
Blum, Helmut; and Hemmann, Siglinde, 4,908,138, Cl. 210-700.000.

Henderson, A. A., Jr.: *See*—
Butcher, R. E.; and Henderson, A. A., Jr., 4,907,699, Cl. 209-3.300.

Henderson, Dewey D., to Dayco Products, Inc. Belt tensioner and method of making the same. 4,908,007, Cl. 474-135.000.

Henderson, Joseph. Storage and handling system. 4,907,706, Cl. 211-46.000.

Henkel Corporation: *See*—
Staubach, Ernst J., 4,908,189, Cl. 422-186.190.

Henkel Kommanditgesellschaft auf Aktien: *See*—
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Holze, Joachim; Kik, Michael; Leitzen, Juergen; Korn, Helmut; Plotsch, Hans; and Meschler, Leo, 4,907,398, Cl. 53-443.000.
Mackenzie, James M. W.; and Cabassi, Peter J., 4,908,125, Cl. 209-166.000.
Wuest, Willi; and Kuehne, Norbert, 4,908,133, Cl. 210-641.000.

Henrich, Richard L. Adjustable multi function rotary bow stabilizer. 4,907,567, Cl. 124-89.000.

Henry, James W.; and Nadeau, Paul G., to Renn-Vertec Inc. Packer harrow implement. 4,907,652, Cl. 172-180.000.

Hensel, Marie-Claude: *See*—
Muller, Werner; Hensel, Marie-Claude; and Huber, August, 4,908,013, Cl. 600-36.000.

Henson, James K.; Bourg, Wilfred M., Jr.; and Henson, William D., to Frito-Lay, Inc. Method and apparatus for uniformly dispensing a seasoning material. 4,907,720, Cl. 222-55.000.

Henson, William D.: *See*—
Henson, James K.; Bourg, Wilfred M., Jr.; and Henson, William D., 4,907,720, Cl. 222-55.000.

Hercules Incorporated: *See*—
Cohen, Richmond R.; and McCarty, Jimmie D., 4,907,609, Cl. 131-332.000.

Herdzina, Frank J.: *See*—
Kossmann, Hans; and Herdzina, Frank J., 4,908,153, Cl. 204-300.0EC.

Hergenrother, Paul M.; and Connell, John W., to United States of America, National Aeronautics and Space Administration. Polyphenylquinoxalines via aromatic nucleophilic displacement. 4,908,426, Cl. 528-125.000.

Herman, Stephen. Flexible tine insect swatter. 4,907,367, Cl. 43-137.000.

Hernandez, Jorge M., to Rogers Corporation. High dielectric constant flexible sheet material. 4,908,258, Cl. 428-198.000.

Herreid, Rodney G.: *See*—
Box, Gary W.; Foote-Lennox, Thomas S.; Herreid, Rodney G.; Hoff, James F.; Leisz, Dennis J.; Perlick, John A.; Steeden, Terry T.; Turner, John J.; and Alexander, Curtis R., 4,908,784, Cl. 364-569.000.

Herrera, Giselle Mary: *See*—
Lloyd, Stephen F., 4,907,661, Cl. 175-325.000.

Hertrich, Friedrich R., to Digital Equipment Corporation. Stored data error correction system. 4,908,826, Cl. 371-40.100.

Hertzer, Ronald A., to Cincinnati Milacron Inc. Hydraulic system for a toggle-type plastic injection molding machine capable of precision coining. 4,907,960, Cl. 425-593.000.

Hess, Aronld M., III. System for carrying articles. 4,907,729, Cl. 224-253.000.

Hessel, John F.; Cardinali, Martin S.; and Aronson, Michael P., to Lever Brothers Company. Stabilized lipolytic enzyme-containing liquid detergent composition. 4,908,150, Cl. 252-174.120.

Hessian, David E.: *See*—
Dranchak, David W.; Engle, David E.; Hessian, David E.; Knight, Alan D.; Ma, Wai M.; Macek, Thomas G.; and Squires, John J., 4,907,975, Cl. 439-67.000.

Hewlett-Packard Company: *See*—
Haagens, Randolph B.; and Keaveny, Thomas A., 4,908,823, Cl. 370-85.100.
Huang, Fred G., 4,908,530, Cl. 307-443.000.
Hexcel Corporation: *See*—
Smith, Donald L.; McDonald, Curtis L.; and Hicks, Jim R., 4,907,323, Cl. 29-2.210.
Hickernell, Fred S., to Motorola, Inc. Acoustooptic transducer arrangement for optical fibers. 4,907,856, Cl. 350-96.290.
Hicks, Jim R.: *See*—
Smith, Donald L.; McDonald, Curtis L.; and Hicks, Jim R., 4,907,323, Cl. 29-2.210.
Hidaka, Norio; Yamamura, Shigeyuki; and Fukuta, Masumi, to Fujitsu Limited. Semiconductor device. 4,908,694, Cl. 357-74.000.
Hier, Richard G.: *See*—
DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.
Higashihara, Masaki; Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, to Canon Kabushiki Kaisha. Automatic focus adjusting device. 4,908,645, Cl. 354-402.000.
Higashino, Shigenori, to Mitsubishi Denki Kabushiki Kaisha. Detecting apparatus for abnormality in inverter circuit. 4,908,756, Cl. 363-58.000.
Higashiura, Kunihiko: *See*—
Yamamoto, Atsushi; Ienaga, Kazuharu; Higashiura, Kunihiko; and Kurohashi, Masaharu, 4,908,353, Cl. 514-19.000.
Higgins, George; and Wrona, James, to McCain Manufacturing Corporation. Signature feeder having improved signature extraction. 4,907,791, Cl. 271-5.000.
Higgins, George A., to Micropore International limited. Radiant electric heater assemblies. 4,908,496, Cl. 219-464.000.
Higuchi, Moeko: *See*—
Koboshi, Shigeharu; Higuchi, Moeko; and Kadota, Shinji, 4,908,300, Cl. 430-393.000.
Hikosaka, Akihide; Mimura, Tsuyoshi; Suzuki, Tomio; Yoshigae, Takeo; and Ito, Shuzo, to Kabushiki Kaisha Kobe Seiko Sho. Process for melting cold iron material. 4,908,059, Cl. 75-43.000.
Hilakos, William; and Patterson, Dwight J., to General Electric Company. Pultrusion apparatus and method for impregnating continuous lengths of multi-filament and multi-fiber structures. 4,907,527, Cl. 118-67.000.
Hilti Aktiengesellschaft: *See*—
Beck, Josef; Hachtel, Hans; and Tobler, Alfred, 4,907,928, Cl. 411-387.000.
Leibhard, Erich, 4,907,917, Cl. 405-261.000.
Maier, Elmar, 4,907,663, Cl. 175-330.000.
Himmetsberger, Alois: *See*—
Wittmann, Heinz; Stritzl, Karl; Luschnig, Franz; Stanzl, Robert; and Himmetsberger, Alois, 4,907,353, Cl. 36-117.000.
Hingarh, Hemraj K.: *See*—
Vora, Madhukar B.; and Hingarh, Hemraj K., 4,908,679, Cl. 357-15.000.
Hintermaier, Eduard: *See*—
Tschepke, Josef; Oerther, Bernhard; and Hintermaier, Eduard, 4,907,394, Cl. 53-412.000.
Hintsa, R. Albert, to Decoustics Limited. Fabric mounting system. 4,907,637, Cl. 160-368.100.
Hinze, Christian K.: *See*—
Schechter, Paul J.; Orwin, John M.; and Hinze, Christian K., 4,908,369, Cl. 514-277.000.
Hirai, Giichi. Heel device for shoes. 4,907,351, Cl. 36-42.000.
Hirako, Osamu: *See*—
Murakami, Nobuaki; and Hirako, Osamu, 4,908,765, Cl. 364-431.050.
Hirano, Hiroyuki: *See*—
Yokogawa, Fumihiko; and Hirano, Hiroyuki, 4,908,811, Cl. 369-54.000.
Hirano, Nagayoshi: *See*—
Ichiki, Aiko; and Hirano, Nagayoshi, 4,907,865, Cl. 350-425.000.
Hiraoka, Kunihide: *See*—
Otawa, Yasuhiko; Maeda, Toshiyuki; Hiraoka, Kunihide; and Okamoto, Katsuo, 4,908,412, Cl. 525-286.000.
Hirata, Kiminori: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.
Hiratsuka, Toshio, to NEC Corporation. Optical connector using a polarization-maintaining optical fiber. 4,907,853, Cl. 350-96.200.
Hirayama, Takayuki: *See*—
Inoue, Kazuo; Yano, Shunji; Yamaji, Hideo; Hirayama, Takayuki; and Hayama, Masato, 4,907,952, Cl. 417-407.000.
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., to Intellicall, Inc. Method and apparatus for altering the access format of telephone calls. 4,908,852, Cl. 379-130.000.
Hironaka, Katsuhiko: *See*—
Ogawa, Yoshinari; Yamashiro, Seiichi; and Hironaka, Katsuhiko, 4,908,407, Cl. 525-113.000.
Hirose, Fumiyuki: *See*—
Kirikami, Seiichi; Sato, Isao; Hirose, Fumiyuki; Arai, Osamu; and Iizuka, Nobuyuki, 4,907,406, Cl. 60-39.182.
Hirose, Masayoshi: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, to Du Pont-Showa Denko Co., Ltd.; and Adeka Argus Chemical Co., Ltd. Plasticizer for chloroprene rubber and plasticized chloroprene rubber. 4,908,400, Cl. 524-303.000.
Hirota, Shinya: *See*—
Teramachi, Keiichi; Kawagoe, Harue; Kumon, Naoki; Hirota, Shinya; Kishie, Hidehiko; Amaki, Tsutomu; and Tsusaka, Harushige, 4,907,305, Cl. 4-542.000.
Hirschel, Ernst H.; Fleckenstein, Hubert; and Thiede, Peter, to Messerschmitt-Boelkow-Blohm GmbH. Wall with a drag reducing surface and method for making such a wall. 4,907,765, Cl. 244-200.000.
Hirukawa, Shigeru: *See*—
Suwa, Kyoichi; Hirukawa, Shigeru; and Tateno, Hiroki, 4,908,656, Cl. 355-53.000.
Hishinuma, Yukio: *See*—
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
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Hitachi Device Engineering Co., Ltd.: *See*—
Koike, Norio; Ozaki, Toshifumi; Nakai, Masaaki; Ando, Haruhisa; Ohba, Shinya; Ono, Hideyuki; Akimoto, Hajime; and Kinugasa, Hajime, 4,908,684, Cl. 357-24.000.
Hitachi Koki Co., Ltd.: *See*—
Arimoto, Akira; Saito, Susumu; Tsuji, Yasuyuki; Namikawa, Osamu; and Mochizuki, Takeshi, 4,908,634, Cl. 346-108.000.
Hitachi, Ltd.: *See*—
Arimoto, Akira; Saito, Susumu; Tsuji, Yasuyuki; Namikawa, Osamu; and Mochizuki, Takeshi, 4,908,634, Cl. 346-108.000.
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Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Hara, Yasuhiko; Doi, Hideaki; Karasaki, Koichi; and Sase, Akira, 4,908,871, Cl. 382-8.000.
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Murooka, Hideyasu; Kyooi, Masayuki; Yamada, Osamu; and Ujiie, Noriaki, 4,908,087, Cl. 156-286.000.
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Okamoto, Yukio; and Murayama, Seiichi, 4,908,492, Cl. 219-121.520.
Sirato, Toshimitsu, 4,908,821, Cl. 370-60.000.
Tsuchiya, Fumio; and Matsubara, Kiyoshi, 4,908,795, Cl. 365-189.010.
Yamagata, Hirotsugu; Oka, Takafumi; Nozawa, Masafumi; and Kawada, Shinichi, 4,908,793, Cl. 365-52.000.
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Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Kato, Yoshitake, 4,908,726, Cl. 360-133.000.
Hitachi Metals, Ltd.: *See*—
Mizohata, Tadashi; and Sakamoto, Daiji, 4,908,548, Cl. 313-497.000.
Hittite Microwave Corporation: *See*—
Ayasli, Yalcin, 4,908,820, Cl. 370-38.000.
Hitz, Hans: *See*—
Schafer, Rolf; and Hitz, Hans, 4,908,206, Cl. 424-95.000.
Hjortsberg, Bengt, to Kanthal AB. Flat electrical resistance heating element. 4,908,497, Cl. 219-539.000.
Ho, Chih Y.; and Mohrbacher, Richard J., to McNeilab, Inc. Fatty acid leukotriene synthesis inhibitors. 4,908,384, Cl. 514-559.000.
Ho, David T.: *See*—
Meisenheimer, Daniel T., Jr.; and Ho, David T., 4,907,622, Cl. 138-31.000.
Ho, I-Chung. Dispenser for irrigation chemicals. 4,907,618, Cl. 137-268.000.
Hobbie, Edward H. Sub-caliber firearm. 4,907,362, Cl. 42-77.000.
Hobza, James M.: *See*—
Bennett, Christopher J.; Hobza, James M.; Katznelson, Ron D.; and Walker, Gordon K., 4,908,859, Cl. 380-10.000.
Hochstein, Waldhelm: *See*—
Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, 4,908,477, Cl. 560-248.000.
Hoda, Takeo: *See*—
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,908,650, Cl. 354-412.000.

Hodogaya Chemical Co., Ltd.: *See*—
Nimura, Isao; Nagasaka, Hideo; Takeuchi, Manabu; Nita, Toshiyuki; and Suzuka, Susumu, 4,908,225, Cl. 427-25.000.
Hoechst Aktiengesellschaft: *See*—
Arndt, Otto; and Papenfuhs, Theodor, 4,908,478, Cl. 562-55.000.
Bianco, Sebastiano, 4,908,382, Cl. 514-471.000.
Dapperheld, Steffen; Schwertfeger, Werner; and Wildt, Manfred, 4,908,107, Cl. 204-59.00F.
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,908,364, Cl. 514-243.000.
Hoechst Celanese Corporation: *See*—
Elango, Varadaraj; and Davenport, Kenneth G., 4,908,476, Cl. 560-144.000.
Kohn, Rachel S., 4,908,266, Cl. 428-333.000.
Kohn, Rachel S., 4,908,267, Cl. 428-333.000.
Hoechst Ceramtec Aktiengesellschaft: *See*—
Heinrich, Juergen; Krauth, Axel; Victor, Karl-Heinz; and Peeken, Heinz, 4,908,081, Cl. 156-89.000.
Hoechst-Roussel Incorporated: *See*—
Martin, Lawrence L.; and Allen, Richard C., 4,908,361, Cl. 514-219.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Martin, Lawrence L.; and Payack, Joseph F., 4,908,360, Cl. 514-213.000.
Hoeffken, Russell W.: *See*—
Mahanay, Herbert S.; and Hoeffken, Russell W., 4,907,420, Cl. 62-291.000.
Hoehr, Lothar: *See*—
Auhorn, Werner; Degen, Hans-Juergen; Hoehr, Lothar; and Riebeling, Ulrich, 4,908,240, Cl. 427-391.000.
Hoekstra, Jurrien. Tensioning stringing davit for power lines. 4,907,782, Cl. 254-134.3PA.
Hoenl, Hans: *See*—
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,908,414, Cl. 525-316.000.
Hoff, James F.: *See*—
Box, Gary W.; Foote-Lennox, Thomas S.; Herreid, Rodney G.; Hoff, James F.; Leisz, Dennis J.; Perlick, John A.; Steeden, Terry T.; Turner, John J.; and Alexander, Curtis R., 4,908,784, Cl. 364-569.000.
Hoffacker, Franz: *See*—
Hofmann, Hans; Broerken, Herbert; and Hoffacker, Franz, 4,908,048, Cl. 55-193.000.
Hoffman, David H.: *See*—
Ma, Di; and Hoffman, David H., 4,908,326, Cl. 437-44.000.
Hoffman, Jerzy; and Ciezarek, Krzysztof J., to Hu Development Corporation. Matrix switch. 4,908,588, Cl. 333-105.000.
Hoffman-La Roche Inc.: *See*—
Guerrato, Alfredo; Karpf, Martin; Berger, Hanny K.; Kompis, Ivan; and Schlageter, Markus, 4,908,470, Cl. 560-46.000.
Hoffmann-La Roche Inc.: *See*—
Klotzer, Wilhelm; Mussner, Renate; Montavon, Marc; and Singewald, Nicolas, 4,908,363, Cl. 514-235.800.
Hoffmann, Werner; and Degner, Dieter, to BASF Aktiengesellschaft. Preparation of 1-(4-hydroxy-phenyl)-butan-3-one and novel intermediates. 4,908,481, Cl. 568-308.000.
Hofmann, Hans; Broerken, Herbert; and Hoffacker, Franz, to Agfa-Gevaert Aktiengesellschaft. Apparatus for degassing liquids by centrifugal force in a frustum shaped body. 4,908,048, Cl. 55-193.000.
Hoga, Hiroshi: *See*—
Shimokawa, Kimiaki; and Hoga, Hiroshi, 4,908,333, Cl. 437-195.000.
Hohe KG: *See*—
Schwarz, Christoph; and Polzer, Herwig W., 4,907,869, Cl. 350-604.000.
Holbrook, Gerald L., to Chrysler Motors Corporation. Fluid switching manually between valves in an automatic transmission. 4,907,475, Cl. 74-867.000.
Holcroft, James W.: *See*—
Kramer, George C.; and Holcroft, James W., 4,908,350, Cl. 514-2.000.
Holder, Peter A. R.: *See*—
Cashen, Ernest R.; and Holder, Peter A. R., 4,908,628, Cl. 342-134.000.
Hole, William L.: *See*—
Howarth, Stephen; and Hole, William L., 4,907,964, Cl. 431-202.000.
Holladay, Brice R. Variable rate boat loader. 4,907,934, Cl. 414-462.000.
Holland, Orin W.: *See*—
Zuhr, Raymond A.; and Holland, Orin W., 4,908,334, Cl. 437-200.000.
Holland, Richard J.; and Buda, Charles, to Colgate-Palmolive Co. Built particulate detergent containing a narrow range alcohol ethoxylate and a PET-POET copolymer soil release agent. 4,908,039, Cl. 8-137.000.
Hollerbach, Thomas R. Prom exercise device for opposing contracture. 4,907,574, Cl. 128-64.000.
Hollinger, Theodore G., to APC-Onsite, Inc. Frequency-independent single-phase to three-phase AC power conversion. 4,908,744, Cl. 363-4.000.
Hollingsworth and Vose Company: *See*—
Badger, John P., 4,908,282, Cl. 429-59.000.
Holmquist, Barton; and Scopes, Robert K., to Endowment for Research in Human Biology, Inc. Device for diluting and mixing liquids and applications for kinetic analysis. 4,908,187, Cl. 422-81.000.
Holroyd, Bruce A., to Eastman Kodak Company. Method and apparatus for automatic printing from microfilm of short image areas. 4,908,654, Cl. 355-41.000.
Holub, Fred F., to General Electric Company. Ternary polymer blends. 4,908,418, Cl. 525-425.000.
Holub, Fred F.; and Schlich, William R., to General Electric Company. Polyetherimide-polyarylate, blends. 4,908,419, Cl. 525-425.000.
Holze, Joachim; Kik, Michael; Leitzen, Juergen; Korn, Helmut; Plotsch, Hans; and Meschler, Leo, to Henkel Kommanditgesellschaft auf Aktien. Method and apparatus for the automatic filling of trays with upright products. 4,907,398, Cl. 53-443.000.
Homeyer, Bernhard: *See*—
Jessen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, 4,908,377, Cl. 514-404.000.
Hon, David C. Expert system simulator for modeling realistic internal environments and performance. 4,907,973, Cl. 434-262.000.
Honda Giken Kogyo K.K.: *See*—
Inoue, Kazuo; Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, 4,907,409, Cl. 60-602.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; and Katoh, Masaaki, 4,907,550, Cl. 123-90.160.
Inoue, Kazuo; Yano, Shunji; Yamaji, Hideo; Hirayama, Takayuki; and Hayama, Masato, 4,907,952, Cl. 417-407.000.
Kaibuki, Shigeo; Watanabe, Shinpei; Takahashi, Mitsugu; and Moriya, Hiroshi, 4,907,331, Cl. 29-213.100.
Motodate, Shoji; Komuro, Nobuaki; and Miyamaru, Yukio, 4,908,540, Cl. 310-240.000.
Nakashima, Tai; and Kitagawa, Tadao, 4,907,428, Cl. 70-264.000.
Honda, Sueaki; Hayashi, Mitsuji; Kiyono, Yasuhiro; Niwa, Takashi; and Hayakawa, Tomohiko, to Omron Tateisi Electronics Co. Push-button switch. 4,908,485, Cl. 200-462.000.
Hondou, Hiroshi: *See*—
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, 4,908,400, Cl. 524-303.000.
Honeywell Inc.: *See*—
Manion, Michael C.; and Ralph, Vernon C., 4,907,513, Cl. 102-527.000.
Martwick, Wilford E.; and Tasson, Brian B., 4,907,510, Cl. 102-434.000.
Ullestad, David C., 4,908,623, Cl. 341-167.000.
Hong, Yan C., to Pao Tao Lock Ltd. Central control case lock. 4,907,430, Cl. 70-312.000.
Hongo, Nobuhisa: *See*—
Kawazoe, Takashi; Akutsu, Shigeru; and Hongo, Nobuhisa, 4,908,541, Cl. 310-270.000.
Hongoh, Takashi: *See*—
Sawabe, Kosaku; and Hongoh, Takashi, 4,908,648, Cl. 354-403.000.
Honjo, Masahiro, to Matsushita Electric Industrial Co., Ltd. Frequency demodulator having circuit cancelling undesired signal components. 4,908,581, Cl. 329-320.000.
Hooper, Alan; North, John M.; and Neat, Robin J., to Dowty Electronic Components Limited. Solid state batteries. 4,908,284, Cl. 429-192.000.
Hooper, Richard G., to NaTec Mines Ltd. Method for baghouse brown plume pollution control. 4,908,194, Cl. 423-235.000.
Hoover Group, Inc.: *See*—
Dabney, Upton R., 4,907,785, Cl. 267-104.000.
Hope, Thomas R.: *See*—
Cubbins, Thomas D.; Hope, Thomas R.; and Michels, John M., 4,908,785, Cl. 364-576.000.
Hoppie, Lyle O.; and Speranza, Donald, to Eaton Corporation. Magnetic regenerative braking system. 4,908,553, Cl. 318-382.000.
Hoppin, George S., III, to Allied-Signal Inc. Heat treatment for dual alloy turbine wheels. 4,907,947, Cl. 416-241.00R.
Horbez, Dominique; Storck, Alain; and Grosbois, Jean, to Rhone-Poulenc Chimie. Electrolytic oxidation of cerium 3^+ values to cerium 4^+ values. 4,908,108, Cl. 204-93.000.
Horigome, Shinkichi: *See*—
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Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,907,866, Cl. 350-426.000.
Horn, William F.: *See*—
Gardner, Robert C.; Giachino, Joseph M.; Horn, William F.; Rhoades, Mark K.; Wells, Marvin D.; and Yockey, Steve J., 4,907,748, Cl. 239-584.000.
Horodysky, Andrew G.: *See*—
Davis, Robert H.; Farng, Liehpao O.; and Horodysky, Andrew G., 4,908,144, Cl. 252-47.500.
Hortlik, Frantisek: *See*—
Burysek, Frantisek; and Hortlik, Frantisek, 4,907,755, Cl. 242-35.50A.
Hoshino, Ikuya; Kimura, Hiroshi; Maekawa, Yukihiro; and Fujimoto, Takayuki, to Sumitomo Light Metal Industries, Ltd. Method and device for controlling strip thickness in rolling mills. 4,907,434, Cl. 72-8.000.
Hosoi, Takashi; and Ishibitsu, Kokichi, to Kyocera Corporation. Gallium arsenide on sapphire heterostructure. 4,908,074, Cl. 148-33.200.
Hosono, Nagao: *See*—
Takada, Yoshihiro; and Hosono, Nagao, 4,907,859, Cl. 350-331.00T.

Hou, Kenneth C.: *See*—
Chen, Wei-Chih; Michaud, Michael A.; and Hou, Kenneth C., 4,908,137, Cl. 210-679.000.

Hou, Mei-Wen H. Telescopic exterior rear view mirror. 4,907,871, Cl. 350-639.000.

Houssian, Vazgen J. Drawdown machines. 4,907,531, Cl. 118-413.000.

Howarth, Stephen; and Hole, William L., to Coal Industry (Patents) Limited. Device for extracting and burning methane. 4,907,964, Cl. 431-202.000.

Howson, David C.; Fellinger, Michael W.; Popken, John A.; Altobellis, Richard M.; Scharf, Bennett J.; and Oshetski, Walter E., to Ivion Corporation. Failsafe apparatus and method for effecting syringe drive. 4,908,017, Cl. 604-67.000.

Howze, Bruce W., to Whelen Technologies, Inc. Loud speaker with horizontal radiation pattern. 4,908,601, Cl. 340-388.000.

Hromas, Joe C., to Schlumberger Technology Corporation. Pressure-controlled well tester operated by one or more selected actuating pressures. 4,907,655, Cl. 166-321.000.

Hsu, Pei H. Blind trimmer. 4,907,325, Cl. 29-33.00P.

Hu, Chenming; and Sapp, Steven P., to National Semiconductor Corporation. High voltage power IC process. 4,908,328, Cl. 437-63.000.

Hu Development Corporation: *See*—
Hoffman, Jerzy; and Ciezarek, Krzysztof J., 4,908,588, Cl. 333-105.000.

Huang, Eddy, to VLSI Technology, Inc. Input circuit having improved noise immunity. 4,908,528, Cl. 307-443.000.

Huang, Fred G., to Hewlett-Packard Company. Non-linear squelch circuit for IEEE-802, 3 protocol. 4,908,530, Cl. 307-443.000.

Huang, Rong-Ting; and Kasemset, Dumrong, to Siemens Aktiengesellschaft. Gas distributor for OMVPE Growth. 4,907,534, Cl. 118-725.000.

Huang, Xiaohua: *See*—
Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., 4,908,116, Cl. 204-299.00R.

Hubbard, Elmer A., Jr. Navigational tape measure-type apparatus. 4,907,348, Cl. 33-767.000.

Hubbell Incorporated: *See*—
Corsi, Paul J.; and Russell, Richard H., 4,907,767, Cl. 248-49.000.

Hubbell, James C.; Stiller, Gordon L.; and Liegeois, David D., to Brunswick Corporation. Evaporable foam pattern for use in casting a cylinder head. 4,907,638, Cl. 164-45.000.

Huber, August: *See*—
Muller, Werner; Hensel, Marie-Claude; and Huber, August, 4,908,013, Cl. 600-36.000.

Hubin, Thomas: *See*—
Merry, J. Bradford; and Hubin, Thomas, 4,907,863, Cl. 350-358.000.

Huckaby, Raymond T.: *See*—
Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., 4,908,116, Cl. 204-299.00R.

Hudgins, Richard D.; and Carr, Scott. Integral composite structure with predetermined electrically conductive networks and method for producing same. 4,908,740, Cl. 362-144.000.

Hudimac, Albert A. Vibration suppressing by electrical termination impedance. 4,908,536, Cl. 310-51.000.

Huebner, Charles F.; and Francis, John E., to Ciba-Geigy Corporation. 2,3-dihydro-2-(4,5-dihydroimidazol-2-yl)-indoles in composition form for reducing intraocular pressure. 4,908,376, Cl. 514-402.000.

Huels Troisdorf AG: *See*—
Leuck, Hans; and Westermann, Hans-Jorg, 4,908,471, Cl. 560-77.000.

Huffman, William F.: *See*—
Callahan, James F.; Huffman, William F.; Newlander, Kenneth A.; and Yim, Nelson C. F., 4,908,475, Cl. 560-115.000.

Huggins, Raymond W.; and Miller, Glen E., to Boeing Company, The. Optical fiber coupled resolver having a reference signal. 4,908,510, Cl. 250-231.130.

Hughes Aircraft Company: *See*—
Assael, David; and Lincoln, Brian, 4,908,875, Cl. 382-52.000.
Basil, Richard V., Jr.; and Leetmaa, Juri G., 4,908,589, Cl. 333-106.000.
Gupta, Madhu S.; Greiling, Paul T.; Rosenbaum, Steven E.; and Pitzalis, Octavius, 4,908,570, Cl. 324-158.00T.
Kubena, Randall L.; and Mayer, Thomas M., 4,908,226, Cl. 427-38.000.

Hughes, Nigel: *See*—
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Hughes, Rowan; Paunovic, Milan; and Zeblisky, Rudolph J., to Kollmorgen Corporation. Method of consistently producing a copper deposit on a substrate by electroless deposition which deposit is essentially free of fissures. 4,908,242, Cl. 427-443.100.

Hujo, Lawrence W. Guide for hand held power saws. 4,907,482, Cl. 83-745.000.

Hung, Liang-Sun; and Agostinelli, John A., to Eastman Kodak Company. Barrier layer arrangement for conductive layers on silicon substrates. 4,908,348, Cl. 505-1.000.

Hung, Ming-Hong, to Du Pont de Nemours, E. I., and Company. Process for dechlorinating 4,5-dichlorofluorodioxolanes to obtain fluorodioxoles. 4,908,461, Cl. 549-455.000.

Hunger, Walter. Fifth wheel coupling. 4,907,815, Cl. 280-435.000.

Hunley, Eugene C., Jr.; Derryberry, Eddie W.; Wachs, Charles D.; Patton, David A.; and Bennett, Richard L., to dreEDco, Inc. Flashlight holder. 4,907,769, Cl. 248-185.000.

Hunold, Klaus: *See*—
Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred, 4,908,173, Cl. 264-63.000.

Hunter, Billy D.; and Tusinski, Joseph. Toric finer-polisher. 4,907,373, Cl. 51-58.000.

Hunter, W. E.; and Falcione, Ronald J., to Calgon Corporation. Hydrolyzed polyacrylamide blends as starch retention aids. 4,908,100, Cl. 162-168.300.

Huppert, James C., to Minnesota Mining and Manufacturing Company. Flap wheel assembly. 4,907,378, Cl. 51-330.000.

Huska, Paul. Terminal block insert device screw. 4,907,989, Cl. 439-812.000.

Hutchins, Clinton E.: *See*—
Ross, Sidney D.; Maher, Galeb H.; and Hutchins, Clinton E., 4,908,338, Cl. 501-1.000.

Huy, Sam: *See*—
Kurita, Atsushi; Hatanaka, Masayuki; and Huy, Sam, 4,908,395, Cl. 522-42.000.

Hwang, Kuo H. Desk lamp-convertible pencil box. 4,908,741, Cl. 362-154.000.

Hyden, Myrna M.: *See*—
Brachtl, Bruno O.; Coppersmith, Don; Hyden, Myrna M.; Matyas, Stephen M., Jr.; Meyer, Carl H. W.; Oseas, Jonathan; Pilpel, Shaiy; and Schilling, Michael, 4,908,861, Cl. 380-25.000.

Hydro-Quebec: *See*—
Alexandrov, Nicolai, 4,907,339, Cl. 29-605.000.

Hydrolab Corporation: *See*—
Garner, William, Jr., 4,908,105, Cl. 204-1.00T.

I.D. International A/S: *See*—
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I.De.A. S.p.A. Institute Of Development In Automotive Engineering: *See*—
Muzzarelli, Marco F., 4,907,672, Cl. 180-233.000.

Ichikawa, Haruo: *See*—
Akiike, Katsumi; and Ichikawa, Haruo, 4,908,594, Cl. 337-49.000.

Ichikawa, Hiroshi: *See*—
Ueda, Shinichi; Ohtaka, Michihiro; Nakayama, Yoshiaki; Shinba, Hiroaki; and Ichikawa, Hiroshi, 4,907,836, Cl. 276-39.100.

Ichiki, Aiko; and Hirano, Nagayoshi, to Fuji Photo Optical Co., Ltd. Variable magnification duplicator lens system. 4,907,865, Cl. 350-425.000.

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Ida, Eiji: *See*—
Ohara, Riichiro; Iwama, Satoshi; Ida, Eiji; and Isobe, Noriyuki, 4,908,401, Cl. 524-495.000.

Ida, Koichi: *See*—
Hara, Hiroshi; Sonobe, Hiraku; Shihou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, 4,907,858, Cl. 350-286.000.

Ide, Yukio; Ohshima, Kohichi; Fujimura, Itaru; and Kageyama, Yoshiyuki, to Ricoh Company, Ltd. Method of making an electrophotographic inorganic photosensitive element using ultraviolet radiation. 4,908,292, Cl. 430-128.000.

Ienaga, Kazuharu: *See*—
Yamamoto, Atsushi; Ienaga, Kazuharu; Higashiura, Kunihiko; and Kurohashi, Masaharu, 4,908,353, Cl. 514-19.000.

Iida, Tetsuya: *See*—
Goto, Junkei; and Iida, Tetsuya, 4,908,624, Cl. 341-172.000.
Uchiyama, Tadamitsu; and Iida, Tetsuya, 4,908,712, Cl. 358-298.000.

Iijima, Kenji: *See*—
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, 4,908,400, Cl. 524-303.000.

Iijima, Kenzaburou; and Sata, Takeo, to Yamaha Corporation. FE-B magnets containing Nd-Pr-Ce rare earth elements. 4,908,076, Cl. 148-302.000.

Iimura, Mituo; Heguri, Masatoshi; Gunji, Satoru; and Ikehara, Kenji, to Nitto Denko Corporation. Porous reinforcement sheet. 4,908,251, Cl. 428-68.000.

Iino, Tadashi, to Yazaki Corporation. Head-up display apparatus for automotive vehicle. 4,908,611, Cl. 340-705.000.

Iizuka, Nobuyuki: *See*—
Kirikami, Seiichi; Sato, Isao; Hirose, Fumiyuki; Arai, Osamu; and Iizuka, Nobuyuki, 4,907,406, Cl. 60-39.182.

Iizuka, Ryuji: *See*—
Nishii, Junji; Inagawa, Ikuo; Yamagishi, Takashi; Morimoto, Shozo; and Iizuka, Ryuji, 4,908,053, Cl. 65-3.110.

Ikeda, Naoki: *See*—
Ishii, Koji; and Ikeda, Naoki, 4,907,507, Cl. 101-142.000.

Ikeda, Shigeji: *See*—
Taguchi, Tetsu; and Ikeda, Shigeji, 4,908,863, Cl. 381-36.000.

Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, to Fanuc Ltd. Axis feedrate output system. 4,908,555, Cl. 318-567.000.

Ikegami Tsushinki Co., Ltd.: *See*—
Koibuchi, Masaaki, 4,908,092, Cl. 156-556.000.

Ikehara, Kenji: *See*—
Iimura, Mituo; Heguri, Masatoshi; Gunji, Satoru; and Ikehara, Kenji, 4,908,251, Cl. 428-68.000.

Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, to Noritsu Koki Co., Ltd.; and Ishihara Sangyo Kaisha, Ltd. Electrophotographic copying apparatus. 4,908,667, Cl. 355-256.000.

Illinois Tool Works, Inc.: *See*—
Ernst, Richard J.; and Paul, Sigismund, 4,907,727, Cl. 222-386.500.

Imada, Eiji: *See*—
Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,908,457, Cl. 548-324.000.

Imamura, Kazunori, to Nikon Corporation. Apparatus for examining the surface of a substrate. 4,908,517, Cl. 250-563.000.

Imazeki, Shuji: *See*—
Ojima, Masahiro; Terao, Motoyasu; Taniguchi, Yoshio; Imazeki, Shuji; and Tomioka, Yasushi, 4,908,813, Cl. 369-94.000.

Imhof, Martin: *See*—
Deckner, Andre G.; Imhof, Martin; and Zweymuller, Karl, 4,908,035, Cl. 623-23.000.

Imi-Tech Corporation: *See*—
Ferro, Gregory A., 4,908,265, Cl. 428-318.400.

Imperial Chemical Industries PLC: *See*—
Balmforth, Brian; and Hughes, Nigel, 4,908,062, Cl. 106-22.000.
Bennett, Peter C.; and Clarke, Rodney J., 4,907,749, Cl. 239-690.000.
Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., 4,908,380, Cl. 514-452.000.
Evans, Martin B.; and Rothon, Roger N., 4,908,396, Cl. 523-202.000.
Gregory, Peter, 4,908,435, Cl. 534-761.000.
Head, Robert A.; and Johnson, Steven, 4,908,297, Cl. 430-284.000.
Rostami, Shamsedin, 4,908,427, Cl. 528-125.000.

Imre, Dobi; Karabelyos, Peter; Kugyela, Janos; and To th, Bela, to Ovegipari Muvek. Process and apparatus for the integral optical examinations of damaging mechanical stresses in the bottom-part of bottles and hollow glassware. 4,908,507, Cl. 250-223.00B.

Imtran Industries, Inc.: *See*—
Harris, Kenneth R., 4,907,504, Cl. 101-40.100.

Inada, Jun: *See*—
Inuiya, Masafumi; Hagino, Yukio; and Inada, Jun, 4,908,709, Cl. 358-213.190.

Inada, Masanori; Suetake, Naruki; Ohtani, Hichiro; and Yamakawa, Tomoya, to Mitsubishi Denki Kabushiki Kaisha. Flow sensor incorporating a thermoresistor. 4,907,446, Cl. 73-118.200.

Inada, Tooru: *See*—
Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, 4,907,962, Cl. 431-174.000.

Inagawa, Ikuo: *See*—
Nishii, Junji; Inagawa, Ikuo; Yamagishi, Takashi; Morimoto, Shozo; and Iizuka, Ryuji, 4,908,053, Cl. 65-3.110.

Indesys, Inc.: *See*—
Tikalsky, Terry, 4,908,828, Cl. 371-69.100.

Inductran Corporation: *See*—
Bolger, John G., 4,907,474, Cl. 475-14.000.

Industrial Technology Research Institute: *See*—
Wu, Neng-Wei, 4,908,332, Cl. 437-192.000.

Infutec Inc.: *See*—
Futakami, Kazuhiko, 4,907,571, Cl. 128-25.00R.

Innovare Resourceful Marketing Group, Inc.: *See*—
Tai, Roland, 4,908,761, Cl. 364-401.000.

Innovision Technologies Group, Inc.: *See*—
Fuller, Kip L., 4,908,617, Cl. 340-932.200.

Inoue, Kazuo; Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, to Honda Giken Kogyo K.K. Supercharging pressure control method for internal combustion engines. 4,907,409, Cl. 60-602.000.

Inoue, Kazuo; and Katoh, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for changing operation timing of valves for internal combustion engine. 4,907,550, Cl. 123-90.160.

Inoue, Kazuo; Yano, Shunji; Yamaji, Hideo; Hirayama, Takayuki; and Hayama, Masato, to Honda Giken Kogyo Kabushiki Kaisha. Turbocharger. 4,907,952, Cl. 417-407.000.

Inoue, Manabu: *See*—
Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,908,651, Cl. 354-434.000.
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,908,650, Cl. 354-412.000.

Inoue, Yasushi: *See*—
Sakono, Takashi; Inoue, Yasushi; and Nakatani, Shigeki, 4,907,551, Cl. 123-196.00R.

Inoue, Yoshiaki; and Komatsu, Toshio, to Mitsubishi Gas Chemical Co., Inc. Oxygen absorbent. 4,908,151, Cl. 252-188.280.

Inovan G.m.b.H. & Co. KG, Metalle und Bauelemente: *See*—
Tilse, Wilhelm, 4,907,988, Cl. 439-751.000.

Inpipe Aktiebolag: *See*—
Jonasson, Vollmar, 4,907,624, Cl. 138-125.000.

Institut Francais du Petrole: *See*—
Rialan, Joseph, 4,908,803, Cl. 367-77.000.

Institut Problem Modelirovanija v Energetiki AN Ukr. SSR: *See*—
Petrov, Vyacheslav V.; Grinko, Dmitry A.; Antonov, Alexandr A.; and Krjuchin, Andrei A., 4,908,814, Cl. 369-100.000.

Institute of Gas Technology: *See*—
Marianowski, Leonard G.; and Remick, Robert J., 4,908,113, Cl. 204-243.00R.

Instytut Immunologii i Terapii Doswiadczalnej -PAN: *See*—
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.

Instytut Przemyslu Farmaceutycznego: *See*—
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.

Integrated Genetics, Inc.: *See*—
Lerner, Terry, 4,908,318, Cl. 435-270.000.

Intellicall, Inc.: *See*—
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,908,852, Cl. 379-130.000.

Intelligent Surgical Lasers: *See*—
Bille, Josef F.; and Brown, Stuart I., 4,907,586, Cl. 606-5.000.

Interface, Inc.: *See*—
McIntosh, Robert H., Jr.; Turbak, Albin F.; and McIntosh, Robert H., Sr., 4,908,209, Cl. 424-409.000.

Interlava AG: *See*—
Kurz, Gerhard, 4,907,316, Cl. 15-319.000.

International Business Machine Corporation: *See*—
Dranchak, David W.; Engle, David E.; Hessian, David E.; Knight, Alan D.; Ma, Wai M.; Macek, Thomas G.; and Squires, John J., 4,907,975, Cl. 439-67.000.

International Business Machines Corporation: *See*—
Blokkum, Dag R.; Johns, Charles R.; Morozink, Lee J.; and Peterson, David L., 4,908,789, Cl. 364-900.000.
Brachtl, Bruno O.; Coppersmith, Don; Hyden, Myrna M.; Matyas, Stephen M., Jr.; Meyer, Carl H. W.; Oseas, Jonathan; Pilpel, Shaiy; and Schilling, Michael, 4,908,861, Cl. 380-25.000.
Conru, H. Ward; Gons, Stephen E.; Osborne, Gordon C., Jr.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., 4,907,734, Cl. 228-123.000.
Hefferon, George J.; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,908,298, Cl. 430-313.000.
Jones, Carol R.; and Susko, Robin A., 4,908,094, Cl. 156-633.000.
McBride, Donald G.; and Shaw, Jane M., 4,908,689, Cl. 357-67.000.
Silvestri, Victor J.; and Tsang, Paul J., 4,908,691, Cl. 357-49.000.
Stoehr, Roland R., 4,908,571, Cl. 324-158.00P.

International Fashion Garments Ltd.: *See*—
Lisowski, Adam, 4,907,298, Cl. 2-212.000.

International Transquip Industries: *See*—
Goldfein, Nathan L., 4,907,842, Cl. 303-13.000.

Interox Chemicals Limited: *See*—
Sankey, John P.; and Johnson, Robert, 4,908,474, Cl. 560-109.000.

Inuiya, Masafumi; Hagino, Yukio; and Inada, Jun, to Fuji Photo Film Co., Ltd. Solid-state electronic imaging device with a photometry function responsive to discarded charge packets. 4,908,709, Cl. 358-213.190.

Irie, Toshio: *See*—
Sato, Susumu; Hashimoto, Osamu; Irie, Toshio; and Matsuno, Nobuo, 4,908,073, Cl. 148-12.00C.

Iriyama, Norio; Shijo, Kunio; and Aoki, Yutaka, to Konica Corporation. Image transmission apparatus. 4,908,714, Cl. 358-405.000.

Ishibashi, Kiyoshi; and Mita, Hideo, to Aisin Seiki Kabushiki Kaisha. Refrigerator. 4,907,412, Cl. 62-6.000.

Ishibashi, Yukio: *See*—
Naito, Kenzo; and Ishibashi, Yukio, 4,908,444, Cl. 540-230.000.

Ishibitsu, Kokichi: *See*—
Hosoi, Takashi; and Ishibitsu, Kokichi, 4,908,074, Cl. 148-33.200.

Ishida, Masamitsu: *See*—
Saotome, Shigeru; and Ishida, Masamitsu, 4,908,520, Cl. 250-327.200.

Ishida, Tokuji: *See*—
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,908,505, Cl. 250-201.000.

Ishihara Sangyo Kaisha, Ltd.: *See*—
Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, 4,908,667, Cl. 355-256.000.

Ishihara, Shousaku; Yokono, Hitoshi; Fujita, Tsuyoshi; Satoh, Ryohei; and Wasai, Kiyotaka, to Hitachi, Ltd. Connector and semiconductor device packages employing the same. 4,908,696, Cl. 357-81.000.

Ishii, Akira; Iwai, Koji; Ito, Ryoichi; and Murakami, Osamu, to Kubota Ltd. Air-cooled type cooling system for engine working machine assembly. 4,907,546, Cl. 123-41.560.

Ishii, Kaoru; Wilkinson, Thomas F.; Dwyer, Stephen J.; and Cooper, Rick, to Texas Instruments Incorporated. Heating lamp assembly for ccvd reactors. 4,908,495, Cl. 219-343.000.

Ishii, Keizou: *See*—
Muramoto, Hisaichi; Saito, Koichi; and Ishii, Keizou, 4,908,468, Cl. 560-14.000.

Ishii, Koji; and Ikeda, Naoki, to Ryobi Ltd. Operating lever mechanism for offset printing press. 4,907,507, Cl. 101-142.000.

Ishii, Norihiro: *See*—
Nemoto, Shusuke; Ishii, Norihiro; and Shimizu, Hiroaki, 4,907,401, Cl. 56-11.300.

Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Electronic control system for internal combustion engine. 4,907,556, Cl. 123-486.000.

Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection system for internal combustion engine. 4,907,557, Cl. 123-488.000.

Ishii, Takashi; Yabe, Hisao; and Kohama, Hajime, to Kabushiki Kaisha Toshiba. Non-ferrous metal mechanical part. 4,908,261, Cl. 428-216.000.

Ishii, Takatoshi; and Kishioka, Kazuya, to Ascii Corporation. Display control apparatus for displacing and displacing color image data. 4,908,700, Cl. 358-22.000.

Ishii, Yoshifumi; and Tsuchiya, Hiroaki, to Mita Industrial Co., Ltd. Image-forming machine having a cover member and comprising

engaging means and hampering means for controlling closure of the cover. 4,908,659, Cl. 355-200.000.

Ishii, Yoshio; and Yanagisawa, Isao, to Yamanouchi Pharmaceutical Co., Ltd. Process of producing guanidinothiazole derivatives. 4,908,454, Cl. 548-193.000.

Ishikawa, Hideo: *See*—
Saeki, Takeaki; Ishikawa, Hideo; and Oki, Tunehei, 4,908,479, Cl. 564-277.000.

Ishikawa, Hiromi; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam scanning device. 4,908,511, Cl. 250-235.000.

Ishikawa, Kazunori; Taniguchi, Takuji; Tsukamoto, Kazumasa; and Goto, Shiro, to Aisin AW Co., Ltd. Separate plate and process for producing the same. 4,908,255, Cl. 428-131.000.

Ishikawa, Shigeo; Tokuda, Hiroshi; and Ninomiya, Akira, to Brother Kogyo Kabushiki Kaisha. Thermal printing apparatus. 4,908,632, Cl. 346-76.0PH.

Ishimaru, Wataru, to Nissan Motor Co., Ltd. V-belt type continuously variable transmission. 4,907,471, Cl. 74-745.000.

Ishizaka, Yutaka: *See*—
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,907,877, Cl. 356-121.000.

Isobe, Noriyuki: *See*—
Ohara, Riichiro; Iwama, Satoshi; Ida, Eiji; and Isobe, Noriyuki, 4,908,401, Cl. 524-495.000.

Isoda, Tetsuo: *See*—
Watanabe, Yoichiro; Aoki, Mitsuo; Isoda, Tetsuo; Nakayama, Nobuhiro; Sasaki, Fumihiro; and Kakigawa, Karumi, 4,908,290, Cl. 430-106.600.

Isomura, Yukio: *See*—
Ogasawara, Shinji; Isomura, Yukio; and Tanimoto, Tetsurou, 4,907,833, Cl. 292-336.300.

Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Coaxial starter. 4,907,464, Cl. 74-7.00A.

Itaya, Masahiko: *See*—
Fuma, Hiroshi; Tamura, Akihiko; Itaya, Masahiko; Shoji, Hisashi; and Soma, Shinobu, 4,908,291, Cl. 430-122.000.

Ito, Hiroaki; and Akiyoshi, Koji, to Tokai Rubber Industries, Ltd. Refregerant transporting hose. 4,907,625, Cl. 138-126.000.

Ito, Hiroshi: *See*—
Hefferon, George J.; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,908,298, Cl. 430-313.000.

Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Paper size selection apparatus for use in copier machines. 4,908,672, Cl. 355-311.000.

Ito, Ryoichi: *See*—
Ishii, Akira; Iwai, Koji; Ito, Ryoichi; and Murakami, Osamu, 4,907,546, Cl. 123-41.560.

Ito, Shotaro: *See*—
Aoyagi, Osamu; Yokoyama, Shoichi; Kaneko, Hirotada; Nakatsuno, Eiji; and Ito, Shotaro, 4,907,646, Cl. 165-151.000.

Ito, Shuzo: *See*—
Hikosaka, Akihide; Mimura, Tsuyoshi; Suzuki, Tomio; Yoshigae, Takeo; and Ito, Shuzo, 4,908,059, Cl. 75-43.000.

Itoh, Nobuyuki: *See*—
Nihira, Hiroyuki; and Itoh, Nobuyuki, 4,908,324, Cl. 437-31.000.

Itoh, Sekio: *See*—
Kobayashi, Kunio; and Itoh, Sekio, 4,907,701, Cl. 209-576.000.

Itoman & Co. Ltd.: *See*—
Nagashima, Tsuneo; and Yamane, Makoto, 4,908,050, Cl. 55-400.000.

Itou, Takeo; Matsuda, Hidemi; Kamitani, Sakae; and Takiura, Norihisa, to Kabushiki Kaisha Toshiba. Method and apparatus for forming a thin film on an outer surface of a display screen of a cathode ray tube. 4,908,232, Cl. 427-72.000.

ITT Corporation: *See*—
Loucks, Richard S., 4,908,626, Cl. 342-60.000.

IVAC Corporation: *See*—
Everest, Charles E., 4,907,895, Cl. 374-130.000.

Ivashina, Albina I.: *See*—
Fedorov, Svyatoslav N.; Ivashina, Albina I.; Gudechko, Valery B.; Alexandrova, Olga G.; and Korshunova, Nadezhda K., 4,907,587, Cl. 606-28.000.

Ivion Corporation: *See*—
Howson, David C.; Fellinger, Michael W.; Popken, John A.; Altobellis, Richard M.; Scharf, Bennett J.; and Oshetski, Walter E., 4,908,017, Cl. 604-67.000.

Iwahashi, Hiroyuki: *See*—
Togawa, Fumio; Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Ueda, Toru, 4,908,864, Cl. 381-43.000.

Iwahashi, Yuuji, to Sony Corporation. Recording medium casing with erase prevention device. 4,908,725, Cl. 360-132.000.

Iwai, Koji: *See*—
Ishii, Akira; Iwai, Koji; Ito, Ryoichi; and Murakami, Osamu, 4,907,546, Cl. 123-41.560.

Iwama, Satoshi: *See*—
Ohara, Riichiro; Iwama, Satoshi; Ida, Eiji; and Isobe, Noriyuki, 4,908,401, Cl. 524-495.000.

Iwamoto, Akira: *See*—
Harada, Masahiro; Matsumura, Makoto; Kino, Toru; Iwamoto, Akira; and Momose, Yoshiaki, 4,908,272, Cl. 428-412.000.

Iwamoto, Kazunari: *See*—
Deguchi, Yoshikuni; Iwarkiri, Hiroshi; Iwamoto, Kazunari; and Yonezawa, Kazuya, 4,908,459, Cl. 549-215.000.

Iwamoto, Keiichi: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; and Torichigai, Masaaki, 4,907,542, Cl. 122-379.000.

Iwamoto, Masatami: *See*—
Yamada, Tadatoshi; Iwamoto, Masatami; Ohara, Akinori; Nakamura, Shirou; and Yamamoto, Yuuichi, 4,908,580, Cl. 328-235.000.

Iwamoto, Takashi: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Iwamoto, Takashi, 4,908,559, Cl. 318-568.220.

Iwarkiri, Hiroshi: *See*—
Deguchi, Yoshikuni; Iwarkiri, Hiroshi; Iwamoto, Kazunari; and Yonezawa, Kazuya, 4,908,459, Cl. 549-215.000.

Iwasawa, Toshiyuki; and Miura, Masayoshi, to Matsushita Electric Industrial Co., Ltd. Ink jet recording apparatus with density control function. 4,908,635, Cl. 346-140.00R.

Iwase, Hiromichi: *See*—
Toriu, Takashi; and Iwase, Hiromichi, 4,908,872, Cl. 382-22.000.

Iwata, Kouichi: *See*—
Yamashita, Yukinori; Iwata, Kouichi; and Sakagami, Seigou, 4,907,677, Cl. 188-73.100.

Iwata, Nobuo; Sakamoto, Koji; and Tanzawa, Miuso, to Ricoh Company, Ltd. Holder device for handling an image carrier of an image forming apparatus. 4,908,661, Cl. 355-211.000.

Iwata, Tsukasa, to NEC Corporation. Display pattern processing apparatus. 4,908,779, Cl. 364-518.000.

Iwatsu Electric Company, Ltd.: *See*—
Washiashi, Morimasa; and Koike, Toshio, 4,907,792, Cl. 271-240.000.

Iyer, Uma: *See*—
Mahjour, Majid; Iyer, Uma; and Fawzi, Mahdi B., 4,908,389, Cl. 514-772.000.

J. I. Case Company: *See*—
Tanis, Dale R., 4,908,002, Cl. 460-114.000.

J. M. Voith GmbH: *See*—
Sollinger, Hans-Peter, 4,907,528, Cl. 118-121.000.
Zag, Heinz; Meinecke, Albrecht; Kolb, Otmar; Mullner, Josef; Csordas, Elemer; and Egelhof, Dieter, 4,908,102, Cl. 162-264.000.

J. W. Harley, Inc.: *See*—
Hazony, Dov; and Berris, Richard E., Jr., 4,907,454, Cl. 73-597.000.

Jaatinen, Per A., to Oy Raumatic AB. Cross-cutting saw. 4,907,940, Cl. 414-789.600.

Jablow, Charles E., to Wang Laboratories, Inc. Data processing system having tunable operating system means. 4,908,750, Cl. 364-200.000.

Jachmann, Jurgen; Weitemeyer, Christian; and Wewers, Dietmar, to Th. Goldschmidt AG. Polysiloxanes with (meth) acrylate ester groups linked through sic groups and their use as radiation-curable coating materials for flat carriers. 4,908,274, Cl. 428-452.000.

Jack, James: *See*—
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 4,908,465, Cl. 558-175.000.

Jackson, Daniel K. System for printed circuit board testing. 4,908,576, Cl. 371-22.300.

Jackson, Winslow E., to Pitney Bowes Inc. Fault tolerant smart card. 4,908,502, Cl. 235-437.000.

Jacob, Keith D., to Dimango Products Corporation. Remotely controlled security system. 4,908,604, Cl. 340-539.000.

Jacobsen, Erik; Overland, Christian; Northeved, Allan; and Langkaer, Carsten, to Ballobex ApS. Method and device for performing a puncturing work on an inflated balloon-like object implanted in a patient. 4,908,011, Cl. 600-12.000.

Jacobson, Kenneth A.; Kirk, Kenneth L.; Linnoila, Markku I.; Miller, Thomas; and Mine, Kazunori, to United States of America, Health and Human Services. Derivatization of amines for electrochemical detection. 4,908,322, Cl. 436-111.000.

Jaguar Cars Limited: *See*—
Reaney, Derek J., 4,907,838, Cl. 296-202.000.

Jahn, Jurgen: *See*—
Claussen, Nils; Jahn, Jurgen; and Petzow, Gunter, 4,908,171, Cl. 264-56.000.

James, Gatacre A. F. Roof ridge ventilators and methods for installing such ventilators. 4,907,499, Cl. 98-42.210.

James River Corporation: *See*—
Fredricks, Richard E.; and Schmelzer, Michael A., 4,908,246, Cl. 428-34.100.
Konrad, Kenneth F.; and Geng, E. David, 4,907,698, Cl. 206-611.000.

Jannin, Dennis R. Protection device for bales. 4,907,380, Cl. 52-4.000.

Janome Sewing Machine: *See*—
Hanyu, Susumu; and Koike, Mikio, 4,907,517, Cl. 112-302.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,908,271, Cl. 428-402.220.

Jauch, Christian M., to Sunbeam Corporation. Mechanical interval timer with calibration means. 4,908,807, Cl. 368-89.000.

Jeal, Harvey P.; and Summerlin, Frederick A., to Avdel Systems Limited. Self-plugging blind fastener. 4,907,922, Cl. 411-43.000.

Jeanneret, Miquel J., to Simian, Marie-Therese, a part interest. Foundry gating system. 4,907,640, Cl. 164-134.000.

Jefferis, Raymond P., III; Engler, Phillip V.; and Rosenblatt, Aaron A., to Scopas Technology Company, Inc., The. Gas sterilant system. 4,908,188, Cl. 422-111.000.

Jeffers, Frederick J., to Eastman Kodak Company. Dual gap cross-field magnetic recording head with single gap signal excitation. 4,908,724, Cl. 360-123.000.

Jensen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Pesticidal substituted 5-ethylamino-1-arylpyrazoles. 4,908,377, Cl. 514-404.000.

Jensen, Niels D.; and Christensen, Jorgen, to Grundfos International A/S. Static frequency converter, especially a frequency converter controlling and/or adjusting the performance data of an electromotor. 4,908,757, Cl. 363-141.000.
Jensen, Svend A.; and Haagensen, Peter, to Lumetech A/S. Method of measuring meat texture. 4,908,703, Cl. 358-106.000.
JFP Energy, Inc.: *See*—
Smith, Marvin L., 4,907,912, Cl. 405-208.000.
Jiang, Xicheng; Zhang, Changgong; Gao, Yizhi; and Deng, Shiqiao, to Jilin University of Technology. Technology and equipment of the stressed skin sheet covering for large passenger vehicles. 4,908,490, Cl. 219-50.000.
Jilin University of Technology: *See*—
Jiang, Xicheng; Zhang, Changgong; Gao, Yizhi; and Deng, Shiqiao, 4,908,490, Cl. 219-50.000.
JLF Designs, Inc.: *See*—
Fournier, James L., 4,907,905, Cl. 402-80.00R.
Johansson, Hans; and Nytomt, Jan, to Saab-Scania Aktiebolag. Method for achieving an elevated charge of an ignition capacitor in a capacitive type ignition system. 4,907,562, Cl. 123-605.000.
John E. Fetzer Foundation: *See*—
Hagerty, James J.; and Danziger, Leslie A., 4,907,864, Cl. 350-413.000.
John Fluke Mfg. Co., Inc.: *See*—
Chapel, Roy W., Jr.; and Duperon, David N., 4,907,341, Cl. 29-612.000.
Johns, Charles R.: *See*—
Blokkum, Dag R.; Johns, Charles R.; Morozink, Lee J.; and Peterson, David L., 4,908,789, Cl. 364-900.000.
Johnsen, Cary T. Safety twist lock connector for an extension power cord. 4,907,985, Cl. 439-369.000.
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Thoma.n, George B., 4,908,203, Cl. 424-86.000.
Johnson & Johnson Consumer Products, Inc.: *See*—
Martin, Patrick E., 4,907,965, Cl. 433-3.000.
Johnson, Michael A.: *See*—
Globig, Michael A.; Johnson, Michael A.; and Wyeth, Richard W., 4,907,885, Cl. 356-349.000.
Johnson, Robert: *See*—
Sankey, John P.; and Johnson, Robert, 4,908,474, Cl. 560-109.000.
Johnson, Steven: *See*—
Head, Robert A.; and Johnson, Steven, 4,908,297, Cl. 430-284.000.
Johnson, Thomas: *See*—
Yannotti, Julian J.; and Johnson, Thomas, 4,908,607, Cl. 340-571.000.
Johnston, David W.: *See*—
Shaffer, John W.; Caleshu, Peter V.; and Johnston, David W., 4,908,546, Cl. 313-331.000.
Johnston Jr., Raymond B. Bolt and nut cover. 4,907,929, Cl. 411-431.000.
Jonasson, Vollmar, to Inpipe Aktiebolag. Thermosetting resin pipe. 4,907,624, Cl. 138-125.000.
Jones, Carol R.; and Susko, Robin A., to International Business Machines Corporation. Method for laminating organic materials via surface modification. 4,908,094, Cl. 156-633.000.
Jones, David D., to US Marine Corporation. L-drive. 4,907,994, Cl. 440-61.000.
Jones, Jerry W.: *See*—
Loomans, Bernard A.; Kowalczyk, James E.; Lange, Harold A.; and Jones, Jerry W., 4,908,104, Cl. 201-25.000.
Jones, Kelly E.; and Noll, Frederick E., to Corning Incorporated. Method for making infrared polarizing glasses. 4,908,054, Cl. 65-30.110.
Jones, Mark I., to CMB Packaging (UK) Limited. Apparatus for flanging tubular polymer articles. 4,907,958, Cl. 425-384.000.
Jones, Nelson E., to United States of America, Energy. Precision alignment device. 4,907,881, Cl. 356-152.000.
Jones, Otis. Grass mower improvement. 4,907,403, Cl. 56-202.000.
Jones, Richard L. Right-of-way double jointer. 4,907,732, Cl. 228-44.500.
Jones, Timothy A.; and Kaluza, Thomas J., to Mobil Oil Corporation. Method and system for determining fluid saturations within natural or simulated fractures. 4,907,442, Cl. 73-38.000.
Jourdain, Gerard E. A.: *See*—
Bouiller, Jean G.; Jourdain, Gerard E. A.; and Loubet, Marc G., 4,907,743, Cl. 239-265.110.
Jourde, Jean-Pierre; and Miettaux, Marc, to Regie Nationale des Usines Renault. Variable flow pump. 4,907,949, Cl. 417-252.000.
Jousson, Pierre-Jean, to Les Produits Associes LPA-Broxo S.A. Oral hygiene device. 4,907,744, Cl. 239-449.000.
Joyce Communication Systems, Inc.: *See*—
Little, Paul D., 4,908,845, Cl. 379-51.000.
Joyride Company: *See*—
Bourdage, Fernand J., 4,907,936, Cl. 414-545.000.
Just, Jack T. H., to Just, Jack T. H. Hydrolysis process. 4,908,067, Cl. 127-37.000.
Kaake, Steven A. F.: *See*—
Nicholson, Robert D.; Kaake, Steven A. F.; and Smith, Robert F., 4,907,915, Cl. 405-229.000.
Kabushiki Kaisha Asaplan: *See*—
Ohno, Matsuo, 4,908,858, Cl. 381-1.000.
Kabushiki Kaisha Kawakami Seisakusho: *See*—
Nasu, Nobuo, 4,907,479, Cl. 83-422.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Hikosaka, Akihide; Mimura, Tsuyoshi; Suzuki, Tomio; Yoshigae, Takeo; and Ito, Shuzo, 4,908,059, Cl. 75-43.000.
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,908,184, Cl. 420-534.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Shirotori, Yozo, 4,907,897, Cl. 384-446.000.
Kabushiki Kaisha Shinkawa: *See*—
Sugiura, Kazuo; and Takeuchi, Takashi, 4,907,790, Cl. 269-21.000.
Kabushiki Kaisha Toshiba: *See*—
Fujioka, Arisa; and Watanabe, Sadakazu, 4,908,704, Cl. 358-108.000.
Goto, Junkei; and Iida, Tetsuya, 4,908,624, Cl. 341-172.000.
Hasegawa, Shinji, 4,908,844, Cl. 378-209.000.
Ishii, Takashi; Yabe, Hisao; and Kohama, Hajime, 4,908,261, Cl. 428-216.000.
Itou, Takeo; Matsuda, Hidemi; Kamitani, Sakae; and Takiura, Norihisa, 4,908,232, Cl. 427-72.000.
Kawano, Mitsumo; and Terada, Tadashi, 4,908,582, Cl. 331-1.00A.
Kikuchi, Kouji; and Endo, Kazuo, 4,908,692, Cl. 357-51.000.
Komiya, Akitoshi; and Kamei, Taketo, 4,908,055, Cl. 65-77.000.
Moriyasu, Takashi; and Mizutani, Hiroyuki, 4,908,778, Cl. 364-513.000.
Nihira, Hiroyuki; and Itoh, Nobuyuki, 4,908,324, Cl. 437-31.000.
Nonoyama, Makoto, 4,908,719, Cl. 358-494.000.
Obama, Masao; and Kikuchi, Masaaki, 4,907,462, Cl. 73-862.360.
Ogura, Masahiko, 4,908,664, Cl. 355-235.000.
Sakamaki, Takeshi, 4,908,186, Cl. 422-64.000.
Sonobe, Yoshiaki, 4,908,722, Cl. 360-46.000.
Tsuneki, Yukio, 4,908,735, Cl. 361-406.000.
Kachman, Robert D.: *See*—
Meyer, Endre A.; and Kachman, Robert D., 4,907,615, Cl. 137-1.000.
Kachur, Isaak Y.: *See*—
Kozachevsky, Gennady G.; Guskov, Valery V.; Boikov, Vladimir P.; Gorodnichev, Jury N.; Sizova, Svetlana I.; Moroz, Viktor A.; Kachur, Isaak Y.; Kholmovsky, Alexandr S.; and Lapshina, Nadezhda V., 4,908,090, Cl. 156-446.000.
Kadohara, Terutake: *See*—
Higashihara, Masaki; Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, 4,908,645, Cl. 354-402.000.
Kadomura, Itsuro: *See*—
Okazaki, Masaaki; and Kadomura, Itsuro, 4,907,786, Cl. 267-140.100.
Kadota, Shinji: *See*—
Koboshi, Shigeharu; Higuchi, Moeko; and Kadota, Shinji, 4,908,300, Cl. 430-393.000.
Kagaisume, Satoshi; and Fukasawa, Kazuo, to Tokyo Electron Limited. Etching device, and etching method. 4,908,095, Cl. 156-643.000.
Kageyama, Yoshiyuki: *See*—
Ide, Yukio; Ohshima, Kohichi; Fujimura, Itaru; and Kageyama, Yoshiyuki, 4,908,292, Cl. 430-128.000.
Kagiyama, Junji: *See*—
Kobayashi, Kiyonori; Kamiya, Masakazu; and Kagiyama, Junji, 4,908,003, Cl. 464-68.000.
Kaibel, Gerd: *See*—
Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, 4,908,477, Cl. 560-248.000.
Kaibuki, Shigeo; Watanabe, Shinpei; Takahashi, Mitsugu; and Moriya, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Mechanism for detaching an automobile door. 4,907,331, Cl. 29-213.100.
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, to Kabushiki Kaisha Kobe Seiko Sho. High strength, corrosion-resistant aluminum alloys for brazing. 4,908,184, Cl. 420-534.000.
Kainuma, Keiji: *See*—
Sasaki, Takashi; Taniguchi, Hajime; and Kainuma, Keiji, 4,908,311, Cl. 435-101.000.
Kajino, Takashi: *See*—
Shibasaki, Ichiro; and Kajino, Takashi, 4,908,685, Cl. 357-27.000.
Kakigawa, Karumi: *See*—
Watanabe, Yoichiro; Aoki, Mitsuo; Isoda, Tetsuo; Nakayama, Nobuhiro; Sasaki, Fumihiro; and Kakigawa, Karumi, 4,908,290, Cl. 430-106.600.
Kakimoto, Kazuo, to NEC Corporation. PSK modulation with an error correction memory. 4,908,840, Cl. 375-60.000.
Kakinuma, Koichiro: *See*—
Majima, Osamu; Kakinuma, Koichiro; Naganuma, Tohru; and Ando, Makoto, 4,908,711, Cl. 358-296.000.
Kaluza, Thomas J.: *See*—
Jones, Timothy A.; and Kaluza, Thomas J., 4,907,442, Cl. 73-38.000.
Kamei, Taketo: *See*—
Komiya, Akitoshi; and Kamei, Taketo, 4,908,055, Cl. 65-77.000.
Kameoka, Kimitaka: *See*—
Katoh, Kazunobu; Takagi, Yoshihiro; Kameoka, Kimitaka; Miyata, Junji; and Ukai, Toshinao, 4,908,293, Cl. 430-264.000.
Kamio, Hajime: *See*—
Nakamura, Kouji; Ohshima, Yukiji; and Kamio, Hajime, 4,908,077, Cl. 148-437.000.
Kamio, Kunimasa: *See*—
Shiomi, Yutaka; Kamio, Kunimasa; Haraguchi, Satoru; and Naitoh, Shigeki, 4,908,417, Cl. 525-422.000.
Kamitani, Sakae: *See*—
Itou, Takeo; Matsuda, Hidemi; Kamitani, Sakae; and Takiura, Norihisa, 4,908,232, Cl. 427-72.000.
Kamiya, Masakazu: *See*—
Kobayashi, Kiyonori; Kamiya, Masakazu; and Kagiyama, Junji, 4,908,003, Cl. 464-68.000.

Kanai, Masahiro; Murakami, Tsutomu; Arai, Takayoshi; and Kawakami, Soichiro, to Canon Kabushiki Kaisha. Process for the formation of a functional deposited film containing groups II and VI atoms by microwave plasma chemical vapor deposition process. 4,908,329, Cl. 437-101.000.

Kanai, Masahiro: *See*—
Arai, Takayoshi; Kanai, Masahiro; Kawakami, Soichiro; and Murakami, Tsutomu, 4,908,330, Cl. 437-170.000.

Kanamori, Yuji, *See*—
Kobari, Katsuo; Ota, Naoto; Suzuki, Naoyuki; and Kanamori, Yuji, 4,908,738, Cl. 361-429.000.

Kandler, William C., to Tecumseh Products Company. Ignition system in an air-cooled engine. 4,907,561, Cl. 123-599.000.

Kane, John M.: *See*—
Carr, Albert A.; Cheng, Hsien C.; and Kane, John M., 4,908,372, Cl. 514-322.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Deguchi, Yoshikuni; Iwarkiri, Hiroshi; Iwamoto, Kazunari; and Yonezawa, Kazuya, 4,908,459, Cl. 549-215.000.

Kaneiwa, Shinji: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,908,830, Cl. 372-46.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,908,831, Cl. 372-46.000.

Kaneko, Hirotada: *See*—
Aoyagi, Osamu; Yokoyama, Shoichi; Kaneko, Hirotada; Nakatsuno, Eiji; and Ito, Shotaro, 4,907,646, Cl. 165-151.000.

Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, to Kokusai Denshin Denwa Co., Ltd.; NEC Corporation; Fujitsu Ltd.; and Nippon Telegraph and Telephone Corporation. Encoding system capable of accomplishing a high efficiency by anterior and/or posterior processing to quantization. 4,908,862, Cl. 380-28.000.

Kanno, Kiyohiro. Adornment device. 4,907,322, Cl. 24-616.000.

Kanno, Toshiyuki; Watanabe, Hitoshi; and Hamanishi, Kohei, to Olympus Optical Co., Ltd. Optical information recording medium. 4,908,294, Cl. 430-270.000.

Kansai Electric Power Co., Inc., The: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; and Torichigai, Masaaki, 4,907,542, Cl. 122-379.000.

Kansai Paint Co., Ltd.: *See*—
Nanishi, Kiyoshi; and Nakayama, Hiroyuki, 4,908,061, Cl. 106-18.310.

Kanthal AB: *See*—
Hjortsberg, Bengt, 4,908,497, Cl. 219-539.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Nemoto, Shusuke; Ishii, Norihiro; and Shimizu, Hiroaki, 4,907,401, Cl. 56-11.300.

Kao Oil Company, Limited: *See*—
Fujii, Masaki; and Minohata, Masanori, 4,908,200, Cl. 423-448.000.

Kar, Naresh J.; Salesky, William J.; and Guzowski, Steven J., to Smith International, Inc. Cast steel rock bit cutter cones having metallurgically bonded cutter inserts. 4,907,665, Cl. 175-410.000.

Karabelyos, Peter: *See*—
Imre, Dobi; Karabelyos, Peter; Kugyela, Janos; and To th, Bela, 4,908,507, Cl. 250-223.00B.

Karasaki, Koichi: *See*—
Hara, Yasuhiko; Doi, Hideaki; Karasaki, Koichi; and Sase, Akira, 4,908,871, Cl. 382-8.000.

Karasaki, Toshihiko; and Sugitani, Kazumi, to Minolta Camera Kabushiki Kaisha. Focus detecting optical system. 4,908,504, Cl. 250-201.200.

Karasaki, Toshihiko: *See*—
Matsui, Toru; and Karasaki, Toshihiko, 4,908,649, Cl. 354-403.000.
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,908,505, Cl. 250-201.000.

Karasawa, Kazumitsu: *See*—
Yoshida, Yasunobu; and Karasawa, Kazumitsu, 4,908,049, Cl. 55-227.000.

Karita, Mitsuji; Shinya, Tsutomu; and Oishi, Tetsuo, to Shinko Electric Co., Ltd. Transporting apparatus. 4,908,533, Cl. 310-12.000.

Karpf, Martin: *See*—
Guerrato, Alfredo; Karpf, Martin; Berger, Hanny K.; Kompis, Ivan; and Schlageter, Markus, 4,908,470, Cl. 560-46.000.

Kasahara, Toshiro: *See*—
Ichiyasu, Yoji; Fujiwara, Katuhiro; Takayasu, Oshiga; and Kasahara, Toshiro, 4,908,745, Cl. 364-140.000.

Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, to Japan Synthetic Rubber Co., Ltd. Capsule-shaped polymer particles and process for the production thereof. 4,908,271, Cl. 428-402.220.

Kasamura, Toshirou: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Kasemeier, James E.; and Fichtinger, Gary R., to Deere & Company. Differential housing support. 4,907,470, Cl. 74-606.00R.

Kasemset, Dumrong: *See*—
Huang, Rong-Ting; and Kasemset, Dumrong, 4,907,534, Cl. 118-725.000.

Kashima, Humihiro: *See*—
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, 4,908,400, Cl. 524-303.000.

Kasprzyk, Martin R.: *See*—
Frechette, Francis J.; Boecker, Wolfgang D. G.; McMurtry, Carl H.; and Kasprzyk, Martin R., 4,908,340, Cl. 501-95.000.

Katayama, Akira: *See*—
Sato, Shigemasa; Katayama, Akira; and Terunuma, Hiroshi, 4,908,646, Cl. 354-402.000.

Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, to Sharp Kabushiki Kaisha. 1,2,4,5-benzoylenebis(anthraquinone[1,2-d]imidazole) compounds. 4,908,457, Cl. 548-324.000.

Kato, Naoyuki, to Mitsubishi Yuka Badische Co., Ltd. Process for producing moldable non-woven fabrics. 4,908,176, Cl. 264-127.000.

Kato, Yoichi: *See*—
Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, 4,908,862, Cl. 380-28.000.

Kato, Yoshitake, to Hitachi Maxell, Ltd. Disk cartride having an improved shutter. 4,908,726, Cl. 360-133.000.

Katoh, Kazunobu; Takagi, Yoshihiro; Kameoka, Kimitaka; Miyata, Junji; and Ukai, Toshinao, to Fuji Photo Film Co., Ltd. Superhigh contrast negative type silver halide photographic material. 4,908,293, Cl. 430-264.000.

Katoh, Masaaki: *See*—
Inoue, Kazuo; and Katoh, Masaaki, 4,907,550, Cl. 123-90.160.

Katsumata, Ryoichi: *See*—
Ozaki, Akio; Katsumata, Ryoichi; and Oka, Tetsuo, 4,908,312, Cl. 435-108.000.

Katz, Solly. Fluid dispenser including an arrangement to impart wave-like motion to the store fluid. 4,907,723, Cl. 222-105.000.

Katznelson, Ron D.: *See*—
Bennett, Christopher J.; Hobza, James M.; Katznelson, Ron D.; and Walker, Gordon K., 4,908,859, Cl. 380-10.000.

Kaufman, Leon; Kramer, David M.; and Guzman, Ricardo, to University of California, The Regents of the. 3D image reconstruction method for placing 3D structure within common oblique or contoured slice-volume without loss of volume resolution. 4,908,573, Cl. 324-309.000.

Kawada, Shinichi: *See*—
Yamagata, Hirotsugu; Oka, Takafumi; Nozawa, Masafumi; and Kawada, Shinichi, 4,908,793, Cl. 365-52.000.

Kawagoe, Harue: *See*—
Teramachi, Keiichi; Kawagoe, Harue; Kumon, Naoki; Hirota, Shinya; Kishie, Hidehiko; Amaki, Tsutomu; and Tsusaka, Harushige, 4,907,305, Cl. 4-542.000.

Kawakami, Kouji: *See*—
Fujitani, Yuuki; and Kawakami, Kouji, 4,907,473, Cl. 475-250.000.

Kawakami, Soichiro: *See*—
Arai, Takayoshi; Kanai, Masahiro; Kawakami, Soichiro; and Murakami, Tsutomu, 4,908,330, Cl. 437-170.000.
Kanai, Masahiro; Murakami, Tsutomu; Arai, Takayoshi; and Kawakami, Soichiro, 4,908,329, Cl. 437-101.000.

Kawamura, Mitsuyoshi: *See*—
Akao, Shigeaki; Hayakawa, Masakatu; and Kawamura, Mitsuyoshi, 4,907,330, Cl. 123-90.510.

Kawano, Mitsumo; and Terada, Tadashi, to Kabushiki Kaisha Toshiba. AFC circuit for producing a ripple-free oscillator control voltage. 4,908,582, Cl. 331-1.00A.

Kawano, Osamu, to NEC Corporation. Multiplex communication arrangement capable of selectively monitoring active multiplexers and of simultaneously checking an input to a stand-by demultiplexer. 4,908,818, Cl. 370-15.000.

Kawasaki Steel Corporation: *See*—
Sato, Susumu; Hashimoto, Osamu; Irie, Toshio; and Matsuno, Nobuo, 4,908,073, Cl. 148-12.00C.

Kawashima, Kiyoharu. Representing utensil. 4,907,903, Cl. 401-151.000.

Kawashima, Saburo: *See*—
Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,908,409, Cl. 528-188.000.

Kawauchi, Susumu: *See*—
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, 4,908,275, Cl. 428-457.000.

Kawazoe, Takashi; Akutsu, Shigeru; and Hongo, Nobuhisa, to Mitsuba Electric Mfg., Co., Ltd. Air-cooled layered coil vehicle AC generator stator. 4,908,541, Cl. 310-270.000.

Kay, Nathan; McNab, Donald; and Moya, Edward, to Photofinish Cosmetics, Inc. Method of making a molded brush. 4,907,841, Cl. 300-21.000.

Kazuyuki, Hisada: *See*—
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.

Kearney: *See*—
Westrom, Arthur C., 4,908,730, Cl. 361-120.000.

Keaveny, Thomas A.: *See*—
Haagens, Randolph B.; and Keaveny, Thomas A., 4,908,823, Cl. 370-85.100.

Keich, George W., to United Technologies Corporation. Method and apparatus for assessing thrust loads on engine bearings. 4,907,943, Cl. 415-1.000.

Keller, Arnold, to Waldemar Link GmbH & Co. Reconstruction prosthesis. 4,908,032, Cl. 623-18.000.

Keller, Arnold: *See—*
Link, Helmut D.; and Keller, Arnold, 4,908,036, Cl. 623-23.000.
Keller, Lee S. Temporary securing device for electric cords. 4,907,984, Cl. 439-369.000.
Kendall Company: *See—*
DeCoste, Leonard D., Jr., 4,907,696, Cl. 206-411.000.
Kennedy, Melvin: *See—*
Arad, Abraham; and Kennedy, Melvin, 4,907,804, Cl. 273-93.00R.
Kerk, Klaus: *See—*
Emmerich, Friedel; Franitza, Dieter; Hartmann, Heinrich; and Kerk, Klaus, 4,907,648, Cl. 165-166.000.
Kerr-McGee Coal Corporation: *See—*
Leonard, Robert E., 4,908,047, Cl. 55-10.000.
Kersey, Alan D.; Bulmer, Catherine; and Dandridge, Anthony, to United States of America, Navy. Integrated-optic, polarization-selective phase modulator. 4,907,849, Cl. 350-96.140.
Kersey, Denise A. Portable desk unit. 4,908,742, Cl. 362-156.000.
Kershaw, Christopher F., to British Pipeline Agency Ltd., et al. Pipeline pig. 4,907,314, Cl. 15-104.061.
Kertz, Malcolm G., to Agristar, Inc. Integument and method for micropropagation and tissue culturing. 4,908,315, Cl. 435-240.400.
Kesling, Christopher K., to TP Orthodontics, Inc. Impression tray for retention of impression material. 4,907,966, Cl. 433-37.000.
Ketchum, Joseph W., Jr. Body waste receptor for bed patients. 4,908,025, Cl. 604-327.000.
Kevonian, Raffi. Theft resistant security containers using shocking wires and audio alarm. 4,908,606, Cl. 340-571.000.
Khazin, Leon; and Kravets, Leonard. Self-organizer. 4,907,827, Cl. 283-65.000.
Kholmovsky, Alexandr S.: *See—*
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Kik, Michael: *See—*
Holze, Joachim; Kik, Michael; Leitzen, Juergen; Korn, Helmut; Plotsch, Hans; and Meschler, Leo, 4,907,398, Cl. 53-443.000.
Kikuchi, Kouji; and Endo, Kazuo, to Kabushiki Kaisha Toshiba. Fuse-containing semiconductor device. 4,908,692, Cl. 357-51.000.
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Obama, Masao; and Kikuchi, Masaaki, 4,907,462, Cl. 73-862.360.
Kikuchi, Naoyuki: *See—*
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Kiliany, Thomas R., Jr.: *See—*
Chou, Tai-sheng; and Kiliany, Thomas R., Jr., 4,908,136, Cl. 210-661.000.
Killcommons, Peter, to Killy Corporation. Connector. 4,907,976, Cl. 439-72.000.
Killy Corporation: *See—*
Killcommons, Peter, 4,907,976, Cl. 439-72.000.
Kim, Il Yoo. Sanitary chemical spray apparatus. 4,907,747, Cl. 239-578.000.
Kimball International, Inc.: *See—*
Underwood, Robert A., 4,907,384, Cl. 52-126.600.
Kimberly-Clark Corporation: *See—*
Miers, Robert M., 4,908,123, Cl. 209-133.000.
Sukiennik, Corrine A.; and Becker, Mollie M., 4,908,026, Cl. 604-378.000.
Kimura, Akiyoshi: *See—*
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.
Kimura, Hiroshi: *See—*
Hoshino, Ikuya; Kimura, Hiroshi; Maekawa, Yukihiro; and Fujimoto, Takayuki, 4,907,434, Cl. 72-8.000.
Kin, Seki: *See—*
Tanaka, Hiroyuki; Kin, Seki; and Pu, Lyong S., 4,908,289, Cl. 430-59.000.
Kinas, Ryszard: *See—*
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.
Kinetic Concepts, Inc.: *See—*
Leininger, Peter A.; and Hajianpour, Mohamad A., 4,907,308, Cl. 5-455.000.
Kinetron B.V.: *See—*
Knapen, Petrus M. J.; and Wouterse, Jonannes H., 4,908,808, Cl. 368-157.000.
King, Russell W., to Medi-Nuclear Corporation, Inc. Radioactive aerosol inhalation apparatus. 4,907,581, Cl. 128-200.180.
Kinghorn, John R., to U.S. Philips Corp. Video cassette recorder programming via teletext transmissions. 4,908,707, Cl. 358-147.000.
Kiniwa, Hideaki: *See—*
Kusano, Hiroshi; Kiniwa, Hideaki; Shimura, Akihiro; and Annaka, Masahiko, 4,908,392, Cl. 521-60.000.
Kinlen, Patrick J.; and Heider, John E., to Monsanto Company. Solid state reference electrode. 4,908,117, Cl. 204-415.000.
Kinney, Clark M., Jr.: *See—*
Kinney, Douglas S.; and Kinney, Clark M., Jr., 4,907,623, Cl. 138-108.000.
Kinney, Douglas S.; and Kinney, Clark M., Jr., to Plastics Tubes Company. Heat-shrinkable insulating tube. 4,907,623, Cl. 138-108.000.
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Harada, Masahiro; Matsumura, Makoto; Kino, Toru; Iwamoto, Akira; and Momose, Yoshiaki, 4,908,272, Cl. 428-412.000.
Kinoshita, Tatsuo; and Minami, Syuji, to Mitsui Petrochemical Industries, Ltd. Modified ethylenic random copolymer. 4,908,411, Cl. 525-285.000.
Kintec, Inc.: *See—*
Wagaman, James P.; and Porter, Gordon A., 4,907,980, Cl. 439-204.000.
Wagaman, James P., 4,907,982, Cl. 439-271.000.
Kinugasa, Hajime: *See—*
Koike, Norio; Ozaki, Toshifumi; Nakai, Masaaki; Ando, Haruhisa; Ohba, Shinya; Ono, Hideyuki; Akimoto, Hajime; and Kinugasa, Hajime, 4,908,684, Cl. 357-24.000.
Kirikami, Seiichi; Sato, Isao; Hirose, Fumiyuki; Arai, Osamu; and Iizuka, Nobuyuki, to Hitachi, Ltd. Combined gas turbine plant. 4,907,406, Cl. 60-39.182.
Kirk, Kenneth L.: *See—*
Jacobson, Kenneth A.; Kirk, Kenneth L.; Linnoila, Markku I.; Miller, Thomas; and Mine, Kazunori, 4,908,322, Cl. 436-111.000.
Kirkpatrick, Ralph A.: *See—*
Kroger, Gerard P.; Peck, Robert A.; and Kirkpatrick, Ralph A., 4,907,944, Cl. 415-65.000.
Kirschner, Michael: *See—*
Przybyla, Bernd; Bruckelt, Alfred; and Kirschner, Michael, 4,908,792, Cl. 364-900.000.
Kiselev, Viktor M., to Ukrainsky Nauchno-Issledovatelsky Institut Prirodnykh Gazov "Ukrniigaz". Axial swirl device for a contact and separation member. 4,908,051, Cl. 55-457.000.
Kishi, Noriyuki: *See—*
Inoue, Kazuo; Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, 4,907,409, Cl. 60-602.000.
Kishie, Hidehiko: *See—*
Teramachi, Keiichi; Kawagoe, Haruo; Kumon, Naoki; Hirota, Shinya; Kishie, Hidehiko; Amaki, Tsutomu; and Tsusaka, Harushige, 4,907,305, Cl. 4-542.000.
Kishioka, Kazuya: *See—*
Ishii, Takatoshi; and Kishioka, Kazuya, 4,908,700, Cl. 358-22.000.
Kissel, Charles L., to Union Oil of California. Method for producing an article containing a radiation cross-linked polymer and the article produced thereby. 4,908,229, Cl. 427-54.100.
Kitagawa, Tadao: *See—*
Nakashima, Tai; and Kitagawa, Tadao, 4,907,428, Cl. 70-264.000.
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, to Canon Kabushiki Kaisha. Objective of variable focal length. 4,907,866, Cl. 350-426.000.
Kitagishi, Nozomu; and Yamazaki, Shoichi, to Canon Kabushiki Kaisha. Optical system for deflecting image. 4,907,868, Cl. 350-463.000.
Kitoh, Makoto: *See—*
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Kivela , Erkki. Control for delivery of power to heating elements. 4,908,498, Cl. 219-494.000.
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Honda, Sueaki; Hayashi, Mitsuji; Kiyono, Yasuhiro; Niwa, Takashi; and Hayakawa, Tomohiko, 4,908,485, Cl. 200-462.000.
Klaerner, Peter: *See—*
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,908,414, Cl. 525-316.000.
Klebba, Lenard D.: *See—*
Rumpf, Robert J.; Refior, Lawrence M.; Klebba, Lenard D.; and Corrion, Steven G., 4,907,757, Cl. 242-107.600.
Klein, Claude. Retractable arrow-support device for a bow. 4,907,566, Cl. 124-41.00A.
Kling, John P.; and Stone Jr., Richard F., to AMP Incorporated. Compact encapsulated filter assembly for printed circuit boards and method of manufacture thereof. 4,908,586, Cl. 333-182.000.
Kloker, Werner: *See—*
Dullings, Josef; Kloker, Werner; Freitag, Dieter; Lusgen, Holger; Schmid, Helmut; and Winchenbach, Helmut, 4,908,216, Cl. 425-3.000.
Klotzer, Wilhelm; Mussner, Renate; Montavon, Marc; and Singewald, Nicolas, to Hoffmann-La Roche Inc. Imidazole derivatives. 4,908,363, Cl. 514-235.800.
Knagenhjelm, Hans O., to Norsk Hydro A.S. Integrated modular tool system for end preparation and end-to-end welding of pipes. 4,908,491, Cl. 219-61.000.
Knapen, Petrus M. J.; and Wouterse, Jonannes H., to Kinetron B.V. Timepiece having a multipolar rotor. 4,908,808, Cl. 368-157.000.
Knapp, Alan G.: *See—*
Woodhead, Alfred W.; Gill, Ronald W. A.; Knapp, Alan G.; Lamport, Daphne L.; and Washington, Derek, 4,908,545, Cl. 313-103.0CM.
Knight, Alan D.: *See—*
Dranchak, David W.; Engle, David E.; Hessian, David E.; Knight, Alan D.; Ma, Wai M.; Macek, Thomas G.; and Squires, John J., 4,907,975, Cl. 439-67.000.
Knotts, Richard W.: *See—*
Rose, Floyd D.; Moore, Steven M.; and Knotts, Richard W., 4,907,483, Cl. 84-726.000.

Knowles, Steve: *See*—
Simon, Mark A.; Knowles, Steve; and Smith, William, 4,907,407, Cl. 60-203.100.

Knudsen, David S., to Miravalle, Peter S.; and Lummus, A. D., a part interest. Machine for applying twist-type ties. 4,907,392, Cl. 53-138.00A.

Kobari, Katsuo; Ota, Naoto; Suzuki, Naoyuki; and Kanamori, Yuji, to Fanuc Ltd. Drived motor control unit. 4,908,738, Cl. 361-429.000.

Kobayashi, Eiji, to Mitsubishi Denki Kabushiki Kaisha. Connective jumper. 4,907,991, Cl. 439-876.000.

Kobayashi, Hironobu: *See*—
Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, 4,907,962, Cl. 431-174.000.

Kobayashi, Kiyonori; Kamiya, Masakazu; and Kagiyama, Junji, to Aisin Seiki Kabushiki Kaisha. Hysteresis mechanism for a torque variation absorbing device. 4,908,003, Cl. 464-68.000.

Kobayashi, Kunio; and Itoh, Sekio, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for inspecting the appearance of semiconductor devices. 4,907,701, Cl. 209-576.000.

Kobayashi, Masahiro: *See*—
Yoshioka, Takeo; Kobayashi, Masahiro; Minagawa, Tadao; and Ujita, Katsu, 4,908,729, Cl. 361-118.000.

Kobayashi, Yoshikazu: *See*—
Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, 4,907,830, Cl. 285-91.000.

Kobayashi, Yukio: *See*—
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, 4,908,420, Cl. 526-76.000.

Koboshi, Shigeharu; Higuchi, Moeko; and Kadota, Shinji, to Konishiroku Photo Industry Co., Ltd. Method of processing silver halide color photographic material. 4,908,300, Cl. 430-393.000.

Koch, Rudolf: *See*—
Frey, Otto; and Koch, Rudolf, 4,908,033, Cl. 623-22.000.

Koch, Thomas L.: *See*—
Chraplyvy, Andrew R.; Koch, Thomas L.; and Tkach, Robert W., 4,908,833, Cl. 372-96.000.

Kocher, Timothy L.: *See*—
Douty, George H.; Fabian, David J.; Kocher, Timothy L.; and Reagan, Joseph R., 4,907,987, Cl. 439-571.000.

Kodama, Seiki, to Mitsubishi Denki Kabushiki Kaisha. Housing of a distributor including an ignition coil for an internal combustion engine. 4,907,563, Cl. 123-635.000.

Koga, Nobuhito: *See*—
Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,908,409, Cl. 528-188.000.

Kogane, Mikio, to Fuji Photo Film Co., Ltd. Boundary display device for division-printing. 4,908,657, Cl. 355-75.000.

Koger, Thurman J., II: *See*—
Baird, James C.; Koger, Thurman J., II; Muckenfuhs, Delmar R.; and Spahni, Milton D., 4,908,247, Cl. 428-34.900.

Kohama, Hajime: *See*—
Ishii, Takashi; Yabe, Hisao; and Kohama, Hajime, 4,908,261, Cl. 428-216.000.

Kohl, Vance L.; and Schlosser, Charles E., to Manitowoc Company, Inc., The. Harvest cycle refrigerant control system. 4,907,422, Cl. 62-352.000.

Kohlman, Paul: *See*—
Govil, Sharad K.; and Kohlman, Paul, 4,908,213, Cl. 424-447.000.

Kohn, Rachel S., to Hoechst Celanese Corp. Ultrathin cellulose ester polymer films and their preparation. 4,908,266, Cl. 428-333.000.

Kohn, Rachel S., to Hoechst Celanese Corp. Ultrathin polyether sulfone films and their preparation. 4,908,267, Cl. 428-333.000.

Koibuchi, Masaaki, to Ikegami Tsushinki Co., Ltd. Apparatus for mounting chip device on printed circuit board. 4,908,092, Cl. 156-556.000.

Koichi, Watanabe: *See*—
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.

Koike, Atsushi: *See*—
Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, 4,908,862, Cl. 380-28.000.

Koike, Kazuyuki: *See*—
Fuchizawa, Tetsuro; and Koike, Kazuyuki, 4,908,295, Cl. 430-272.000.

Koike, Michiro: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Koike, Mikio: *See*—
Hanyu, Susumu; and Koike, Mikio, 4,907,517, Cl. 112-302.000.

Koike, Norio; Ozaki, Toshifumi; Nakai, Masaaki; Ando, Haruhisa; Ohba, Shinya; Ono, Hideyuki; Akimoto, Hajime; and Kinugasa, Hajime, to Hitachi, Ltd.; and Hitachi Device Engineering Co., Ltd. Solid-state imaging device. 4,908,684, Cl. 357-24.000.

Koike, Toshio: *See*—
Washiashi, Morimasa; and Koike, Toshio, 4,907,792, Cl. 271-240.000.

Koito Manufacturing Co., Ltd.: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,908,560, Cl. 318-603.000.

Koizumi, Yutaka: *See*—
Saito, Atsushi; Koizumi, Yutaka; Mori, Toshihiro; and Nozawa, Minoru, 4,908,636, Cl. 346-140.00R.

Kojima, Youichi: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,908,106, Cl. 204-23.000.

Kok, Piet: *See*—
Vervloet, Ludovicus H.; De Smedt, Willy P.; Vermeulen, Leon L.; and Kok, Piet, 4,908,286, Cl. 430-10.000.

Kokaku, Yuichi: *See*—
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, 4,908,862, Cl. 380-28.000.

Kolb, Otmar: *See*—
Zag, Heinz; Meinecke, Albrecht; Kolb, Otmar; Mullner, Josef; Csordas, Elemer; and Egelhof, Dieter, 4,908,102, Cl. 162-264.000.

Kollmorgen Corporation: *See*—
Hughes, Rowan; Paunovic, Milan; and Zeblisky, Rudolph J., 4,908,242, Cl. 427-443.100.

Komatsu, Toshio: *See*—
Inoue, Yoshiaki; and Komatsu, Toshio, 4,908,151, Cl. 252-188.280.

Komatsuzaki, Hiroshi; Asano, Seiji; and Fujita, Yoshihiro. Camera. 4,908,642, Cl. 354-400.000.

Komiya, Akitoshi; and Kamei, Taketo, to Kabushiki Kaisha Toshiba. Method of manufacturing thereof fluorescent lamp. 4,908,055, Cl. 65-77.000.

Kompis, Ivan: *See*—
Guerrato, Alfredo; Karpf, Martin; Berger, Hanny K.; Kompis, Ivan; and Schlageter, Markus, 4,908,470, Cl. 560-46.000.

Komuro, Nobuaki: *See*—
Motodate, Shoji; Komuro, Nobuaki; and Miyamaru, Yukio, 4,908,540, Cl. 310-240.000.

Kone Elevator GmbH: *See*—
Suur-Askola, Seppo, 4,908,563, Cl. 318-760.000.

Konica Corporation: *See*—
Gunji, Kouichi, 4,908,663, Cl. 355-218.000.
Iriyama, Norio; Shijo, Kunio; and Aoki, Yutaka, 4,908,714, Cl. 358-405.000.
Masuda, Keiji; Nakazawa, Kazuhiro; and Ura, Hiroaki, 4,908,513, Cl. 250-324.000.

Konig: *See*—
Pesch, Jurgen; and Konig, 4,907,938, Cl. 414-749.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fukuchi, Masakazu; and Haneda, Satoshi, 4,908,287, Cl. 430-58.000.
Fuma, Hiroshi; Tamura, Akihiko; Itaya, Masahiko; Shoji, Hisashi; and Soma, Shinobu, 4,908,291, Cl. 430-122.000.
Koboshi, Shigeharu; Higuchi, Moeko; and Kadota, Shinji, 4,908,300, Cl. 430-393.000.
Nakamura, Shinichi; and Shibue, Toshiaki, 4,908,304, Cl. 430-615.000.

Konrad, Kenneth F.; and Geng, E. David, to James River Corporation. Ice cream carton, carton blank, and method of assembly. 4,907,698, Cl. 206-611.000.

Kopian, Thomas O. Soft latex figure and method of making the same. 4,908,001, Cl. 446-385.000.

Kopp, Harold W. Rebound baseball training apparatus. 4,907,801, Cl. 273-26.00R.

Korn, Helmut: *See*—
Holze, Joachim; Kik, Michael; Leitzen, Juergen; Korn, Helmut; Plotsch, Hans; and Meschler, Leo, 4,907,398, Cl. 53-443.000.

Koroku, Syuichiro: *See*—
Sowa, Nobuhiro; and Koroku, Syuichiro, 4,907,564, Cl. 125-21.000.

Korshunova, Nadezhda K.: *See*—
Fedorov, Svyatoslav N.; Ivashina, Albina I.; Gudechko, Valery B.; Alexandrova, Olga G.; and Korshunova, Nadezhda K., 4,907,587, Cl. 606-28.000.

Kortenbach Verwaltungs-und Beteiligungung Sggesellschaft mbH & Co.: *See*—
Stamm, Peter, 4,907,614, Cl. 135-20.00R.

Korytko, Myron L, to Efco, Inc. Step forging press. 4,907,436, Cl. 72-184.000.

Korzow, Nick, Jr.: *See*—
Larson, Duane B.; and Korzow, Nick, Jr., 4,907,433, Cl. 72-8.000.

Kossmann, Hans; and Herdzina, Frank J., to Service Tool Die & Mfg. Company. Transport apparatus for electrocoating machines. 4,908,153, Cl. 204-300.0EC.

Kostev, Fedor I.: *See*—
Kresjun, Valentin I.; Aryaev, Vadim L.; Rudenko, Georgy M.; Vrublevsky, Andrei G.; Kostev, Fedor I.; Maximovich, Roman Y., deceased; and Maximovich, Roman Y., administrator, 4,908,374, Cl. 514-330.000.

Kotani, Matahira; Hachinoda, Masayuki; Matsuda, Toshihiro; Nakajiri, Takashi; and Hayashi, Motohiko, to Sharp Kabushiki Kaisha. Facsimile apparatus operable in facsimile or conversation mode. 4,908,851, Cl. 379-100.000.

Koval, Richard; Aman, Robert C., Jr.; and Krause, Walter O., to Parker Hannifin Corporation. Shock resistant receiver dehydrator. 4,908,132, Cl. 210-446.000.

Kowalczyk, James E.: *See*—
Loomans, Bernard A.; Kowalczyk, James E.; Lange, Harold A.; and Jones, Jerry W., 4,908,104, Cl. 201-25.000.

Koyama, Osamu: *See*—
Hara, Hiroshi; Sonobe, Hiraku; Shibou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, 4,907,858, Cl. 350-286.000.

Koyama, Shuntaro: *See*—
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.

Koyo Seiko Co., Ltd.: *See*—
Okumura, Tsuyoshi, 4,907,445, Cl. 73-118.100.
Taniguchi, Manabu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, 4,907,460, Cl. 73-862.330.

Kozachevsky, Gennady G.; Guskov, Valery V.; Boikov, Vladimir P.; Gorodnichev, Jury N.; Sizova, Svetlana I.; Moroz, Viktor A.; Kachur, Isaak Y.; Kholmovsky, Alexandr S.; and Lapshina, Nadezhda V. Apparatus for pressure-forming and curing of polymer products. 4,908,090, Cl. 156-446.000.

Krallmann, Reinhold: *See*—
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.

Kramer, David M.: *See*—
Kaufman, Leon; Kramer, David M.; and Guzman, Ricardo, 4,908,573, Cl. 324-309.000.

Kramer, George C.; and Holcroft, James W., to University of California, The Regents of the. Hyperosmotic/hyperoncotic solutions for resuscitation of hypodynamic shock. 4,908,350, Cl. 514-2.000.

Kramer, Walter; Krumm, Klemens; and Ott, Hans D., to Reifenhauser GmbH & Co., Maschinenfabrik. Apparatus for cooling a melt strip of thermoplastic synthetic resin and process. 4,908,165, Cl. 264-22.000.

Kramer, Wolfgang: *See*—
Aichele, Karl; Kramer, Wolfgang; Lang, Ernst; Linssen, Mathias; Stemmer, Alois; and Wissmann, Michael, 4,907,746, Cl. 239-472.000.

Kratos Analytical Limited: *See*—
Caprioli, Richard M.; and Cottrell, John S., 4,908,512, Cl. 250-288.000.

Krause, Walter O.: *See*—
Koval, Richard; Aman, Robert C., Jr.; and Krause, Walter O., 4,908,132, Cl. 210-446.000.

Krauth, Axel: *See*—
Heinrich, Juergen; Krauth, Axel; Victor, Karl-Heinz; and Peeken, Heinz, 4,908,081, Cl. 156-89.000.

Krautzberger, Dieter, to Babcock-BSH Aktiengesellschaft vormals Buttner-Shilde-Haas AG. Blade assembly for planer cutter head. 4,907,631, Cl. 144-230.000.

Kravets, Leonard: *See*—
Khazin, Leon; and Kravets, Leonard, 4,907,827, Cl. 283-65.000.

Kresjun, Valentin I.; Aryaev, Vadim L.; Rudenko, Georgy M.; Vrublevsky, Andrei G.; Kostev, Fedor I.; Maximovich, Roman Y., deceased; and Maximovich, Roman Y., administrator. Pharmaceutical preparation for prophylaxis and treatment of alcoholism. 4,908,374, Cl. 514-330.000.

Kresse, John A. Line lock. 4,907,521, Cl. 114-162.000.

Kressly, Richard H.; Dale, Greogry B.; and Plant, William J., to FMC Corporation. Pallet unloader. 4,907,933, Cl. 414-334.000.

Kreusel, Ulrich. Linking device for a pipe to a structural component. 4,907,907, Cl. 403-171.000.

Kreuzer, Helmut; and Meier, Klaus-Peter, to Robert Bosch GmbH. Insulated dynamo windings. 4,908,535, Cl. 310-45.000.

Krieger, Klaus, to Robert Bosch GmbH. Exhaust-gas recirculating system for internal-combustion engines. 4,907,560, Cl. 123-569.000.

Kristensen, Willy D.: *See*—
Lund, Svend A.; and Kristensen, Willy D., 4,908,774, Cl. 364-507.000.

Krjuchin, Andrei A.: *See*—
Petrov, Vyacheslav V.; Grinko, Dmitry A.; Antonov, Alexandr A.; and Krjuchin, Andrei A., 4,908,814, Cl. 369-100.000.

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Kroyer, Karl K. K. Extracorporal thermo-therapy device and method for curing diseases. 4,908,014, Cl. 604-4.000.

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Krueger, Wolfgang, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Internal combustion chamber arrangement. 4,907,411, Cl. 60-753.000.

Kruger, Robert A.: *See*—
DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.

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Krulikowski, Joseph: *See*—
Hart, David W.; Dunas, Bohdan; and Krulikowski, Joseph, 4,907,524, Cl. 114-356.000.

Krum, Richard G.; and Bucknam, Neil E., to Magnetic Peripherals Inc. Disk drive unit. 4,908,715, Cl. 360-97.020.

Krumm, Klemens: *See*—
Kramer, Walter; Krumm, Klemens; and Ott, Hans D., 4,908,165, Cl. 264-22.000.

Krusi, Fritz. Apparatus for machining a workpiece of wood, in particular wood beams. 4,907,337, Cl. 29-568.000.

Kubena, Randall L.; and Mayer, Thomas M., to Hughes Aircraft Company. Selective area nucleation and growth method for metal chemical vapor deposition using focused ion beams. 4,908,226, Cl. 427-38.000.

Kubo, Masahiro: *See*—
Aramaki, Minoru; Nakano, Hisazi; and Kubo, Masahiro, 4,908,415, Cl. 525-356.000.

Kubodera, Masao: *See*—
Inoue, Kazuo; Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, 4,907,409, Cl. 60-602.000.

Kubofcik, Kenneth W. Low-level radiation waste management system. 4,907,717, Cl. 220-404.000.

Kubota, Atsushi: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Kubota Ltd.: *See*—
Ishii, Akira; Iwai, Koji; Ito, Ryoichi; and Murakami, Osamu, 4,907,546, Cl. 123-41.560.
Machida, Satoshi; Hasegawa, Shigekazu; Ota, Yoshimi; and Okamoto, Muneji, 4,907,465, Cl. 74-89.200.

Kubota, Mineo: *See*—
Tamada, Kazukiyo; Takatori, Naoki; Yokoyama, Tsuneo; Mikajiri, Satoshi; Kubota, Mineo; and Saito, Hiroshi, 4,908,643, Cl. 354-400.000.

Kubovy, Miloslav: *See*—
Burysek, Frantisek; Kubovy, Miloslav; Planansky, Agaton; and Mladek, Milos, 4,908,006, Cl. 474-117.000.

Kuboyama, Hiroshi: *See*—
Tsunashima, Kenji; Mimura, Takashi; Sumiya, Takashi; and Kuboyama, Hiroshi, 4,908,277, Cl. 428-480.000.

Kudo, Hiroaki: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,908,830, Cl. 372-46.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,908,831, Cl. 372-46.000.

Kudo, Masaki: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.

Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,908,650, Cl. 354-412.000.

Kuehl, Steven J.: *See*—
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 4,907,419, Cl. 62-263.000.

Kuehne, Norbert: *See*—
Wuest, Willi; and Kuehne, Norbert, 4,908,133, Cl. 210-641.000.

Kuetterer, Gerhard: *See*—
Gall, Arthur; Kuetterer, Gerhard; and Richter, Helmut, 4,908,843, Cl. 378-99.000.

Kugyela, Janos: *See*—
Imre, Dobi; Karabelyos, Peter; Kugyela, Janos; and To th, Bela, 4,908,507, Cl. 250-223.00B.

Kuhlmann, Klaus: *See*—
Leibe, Gerhard; Kuhlmann, Klaus; and Weiss, Albert, 4,908,824, Cl. 370-85.150.

Kuhn, John B., to Deere & Company. Key shift transmission. 4,907,466, Cl. 74-378.000.

Kuijer, William L.; Van As, Jacobus P. K. M.; and Traksel, Frans J., to U.S. Philips Corporation. A resiliently deformable container for mercury, and lamp and method of its manufacture using such a container. 4,907,998, Cl. 445-9.000.

Kulikowski, Ernest F.; and Fournier, Paul J. E., to Aeroquip Corporation. Automatic shut-off and self-locking refueling nozzle. 4,907,630, Cl. 141-384.000.

Kum, Kwang N., to Noguchi, Tsuneharu. Disposable adhesive bandage. 4,907,579, Cl. 128-156.000.

Kumakura, Toshiyuki, to Canon Kabushiki Kaisha. Electronic flash unit. 4,908,552, Cl. 315-241.00P.

Kumon, Naoki: *See*—
Teramachi, Keiichi; Kawagoe, Harue; Kumon, Naoki; Hirota, Shinya; Kishie, Hidehiko; Amaki, Tsutomu; and Tsusaka, Harushige, 4,907,305, Cl. 4-542.000.

Kung, Jerry: *See*—
Chung, J. M.; and Kung, Jerry, 4,908,637, Cl. 346-160.000.

Kuno, Michiaki; Akizuki, Noboru; and Nishida, Taizo, to Sharp Kabushiki Jausga. Electronic calculator having graph displaying function. 4,908,786, Cl. 364-710.110.

Kunze, Michael: *See*—
Buhler, Ulrich; Hahnke, Manfred; Kunze, Michael; and Bode, Albert, 4,908,042, Cl. 8-639.000.

Kupcis, Edgars A.: *See*—
Bala, Paul F.; Kupcis, Edgars A.; and Fisher, William B., 4,908,619, Cl. 340-966.000.

Kupper, Wilhelm, to W. Schlafhorst & Co. Device for the transfer of bobbins from a conveyor belt with a large loading capacity to a

bobbin conveyor with a small loading capacity. 4,907,688, Cl. 198-463.400.

Kurakake, Mitsuo; Sakamoto, Keiji; and Iwamoto, Takashi, to Fanuc Ltd. Robot control apparatus. 4,908,559, Cl. 318-568.220.

Kuramochi, Tsuneo, to Meiji Seika Kaisha, Ltd. Daunorubicin, doxorubicin and pharmaceutically acceptable salts therefore as antiretroviral agents. 4,908,438, Cl. 536-6.400.

Kuramoto, Isao: *See*—
Taniguchi, Manabu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, 4,907,460, Cl. 73-862.330.

Kuribayashi, Hirotaka: *See*—
Suzuki, Hideo; Fujita, Yoshio; and Kuribayashi, Hirotaka, 4,907,484, Cl. 84-661.000.

Kurimoto, Kazunori, to Tokai Chemical Industries, Ltd. Method of producing an annular foam product. 4,908,170, Cl. 264-46.500.

Kurita, Atsushi; Hatanaka, Masayuki; and Huy, Sam, to Toshiba Silicone Co., Ltd. Photocurable adhesive composition for glass. 4,908,395, Cl. 522-42.000.

Kurita, Naoyasu: *See*—
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, 4,908,400, Cl. 524-303.000.

Kurita, Takashi: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,908,560, Cl. 318-603.000.

Kuriyama, Masaaki, to Minolta Camera Kabushiki Kaisha. Magnified image projector apparatus. 4,907,873, Cl. 353-101.000.

Kuriyama, Minoru: *See*—
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,556, Cl. 123-486.000.
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,557, Cl. 123-488.000.

Kurkowski, Hal: *See*—
Lee, Robert D.; Kurkowski, Hal; and Bolan, Michael L., 4,908,796, Cl. 365-189.050.

Kuroda, Muneo, to Minolta Camera Kabushiki Kaisha. Light beam scanning optical system. 4,908,708, Cl. 358-206.000.

Kurohashi, Masaharu: *See*—
Yamamoto, Atsushi; Ienaga, Kazuharu; Higashiura, Kunihiko; and Kurohashi, Masaharu, 4,908,353, Cl. 514-19.000.

Kurokawa, Koichi: *See*—
Amano, Tomoyuki; Kurokawa, Koichi; and Edamura, Koji, 4,908,080, Cl. 149-2.000.
Tasaki, Yoji; Tanaka, Akihiro; Kurokawa, Koichi; Hattori, Katsuhide; and Amano, Motoyuki, 4,908,079, Cl. 149-2.000.

Kurokawa, Takio: *See*—
Nakayama, Akihiro; and Tachiki, Tomoko, 4,907,809, Cl. 273-242.000.

Kurosaka, Hirosige: *See*—
Yamamoto, Nobuyoshi; Murata, Yasuhiko; Saeki, Fumimasa; and Kurosaka, Hirosige, 4,907,667, Cl. 180-89.130.

Kuroyone, Kazuo, to Anritsu Corporation. Turret punch press machine. 4,907,480, Cl. 83-552.000.

Kurz, Gerhard, to Interlava AG. Device for disinfecting rooms and floor coverings. 4,907,316, Cl. 15-319.000.

Kurz, K. Thomas: *See*—
Ginter, L. James; and Kurz, K. Thomas, 4,907,673, Cl. 182-81.000.

Kusaka, Kazuo; Suehiro, Shigeo; Tajiri, Noboru; Nakamura, Kiyoshi; and Okimoto, Tsuyoshi, to Sanken Sangyo Kabushiki Kaisha; and Aishin Seiki Kabushiki Kaisha. Apparatus for successively fusing small particles of nonferrous metal. 4,907,784, Cl. 266-235.000.

Kusano, Hiroshi; Kiniwa, Hideaki; Shimura, Akihiro; and Annaka, Masahiko, to Mitsubishi Kasei Corporation. Process for producing crosslinked polymer particles. 4,908,392, Cl. 521-60.000.

Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, to Canon Kabushiki Kaisha. Hologram member. 4,908,285, Cl. 430-1.000.

Kusnierczyk, Halina: *See*—
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.

Kusumoto, Hiroshi, to Ricoh Company, Ltd. Cleaning device for an image recorder. 4,908,671, Cl. 355-298.000.

Kusumoto, Toshihiko: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Kutner, Andrzej: *See*—
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.

Kuttenkeuler, Bernhard: *See*—
Bunger, Hans-Joachim; and Kuttenkeuler, Bernhard, 4,907,635, Cl. 160-84.100.

Kuusik, Uno; and Plotzke, Ronald J., to Chrysler Motors Corporation. Park locking mechanism for an automatic transmission. 4,907,681, Cl. 192-4.00A.

Kuwasawa, Mitsuru: *See*—
Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, 4,908,555, Cl. 318-567.000.

Kuwayama, Tetsuro: *See*—
Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,908,285, Cl. 430-1.000.

Kwon, Ik B.; Park, Hyung H.; and An, Bong J., to Lot^e Confectionery Co., Ltd. Chewing gum designed to prevent tooth decay by blending a soluble extract of cacao bean husk. 4,908,212, Cl. 424-440.000.

Kyocera Corporation: *See*—
Hosoi, Takashi; and Ishibitsu, Kokichi, 4,908,074, Cl. 148-33.200.

Kyooi, Masayuki: *See*—
Murooka, Hideyasu; Kyooi, Masayuki; Yamada, Osamu; and Ujiie, Noriaki, 4,908,087, Cl. 156-286.000.

Kyotani, Hirochika: *See*—
Taniguchi, Manabu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, 4,907,460, Cl. 73-862.330.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Ozaki, Akio; Katsumata, Ryoichi; and Oka, Tetsuo, 4,908,312, Cl. 435-108.000.

Laboratoire Primatech Inc.: *See*—
Dion, Jean-Paul, 4,907,730, Cl. 227-8.000.

Laboratories Boi, S.A.: *See*—
Coma Julia, Concepcion, 4,908,111, Cl. 204-157.620.

Laborlux S. A.: *See*—
Beckmann, Franz; and Wagner, Armand, 4,908,167, Cl. 264-29.300.

Labounty, Kenneth R. Slipper bucket for grapple. 4,907,356, Cl. 37-117.500.

Lach, Dietrich; Eckert, Guenter; Maltry, Werner; and Fischer, Kar', to BASF Aktiengesellschaft. Finishing of leather. 4,908,239, Cl. 427-389.000.

Ladner, Robert C.: *See*—
Pantoliano, Michael W.; and Ladner, Robert C., 4,908,773, Cl. 364-496.000.

Lagace, Arthur P.: *See*—
Cook, Edward J.; and Lagace, Arthur P., 4,908,154, Cl. 252-314.000.

Lagor S.p.A.: *See*—
Li Bassi, Giuseppe; and Ortica, Roberto, 4,908,398, Cl. 524-99.000.

Lamb, Bruce J.: *See*—
Stepaniuk, Nickolas J.; and Lamb, Bruce J., 4,908,270, Cl. 423-386.000.

Lambert, Claude; and Pepin, Regis, to Rhone-Poulenc Agrochimie. Fungicidal compositions based on nicotinic derivatives. 4,908,375, Cl. 514-342.000.

Lamport, Daphne L.: *See*—
Woodhead, Alfred W.; Gill, Ronald W. A.; Knapp, Alan G.; Lamport, Daphne L.; and Washington, Derek, 4,908,545, Cl. 313-103.0CM.

Lancer Corporation: *See*—
Durham, Samuel, 4,907,725, Cl. 222-129.100.

Landolt, Gary A. Clutch for automotive vehicles. 4,907,685, Cl. 192-485.000.

Lane, John D.; Matsko, Theodore N.; Patella, Joseph G.; and Scheib, Thomas J., to Babcock & Wilcox Company, The. Advanced proportional plus integral plus derivative controller. 4,908,747, Cl. 364-162.000.

Lang, Ernst: *See*—
Aichele, Karl; Kramer, Wolfgang; Lang, Ernst; Linssen, Mathias; Stemmer, Alois; and Wissmann, Michael, 4,907,746, Cl. 239-472.000.

Lange, David V.: *See*—
Cronin, Dennis C.; and Lange, David V., 4,908,103, Cl. 162-358.000.

Lange, Harold A.: *See*—
Loomans, Bernard A.; Kowalczyk, James E.; Lange, Harold A.; and Jones, Jerry W., 4,908,104, Cl. 201-25.000.

Langkaer, Carsten: *See*—
Jacobsen, Erik; Overland, Christian; Northeved, Allan; and Langkaer, Carsten, 4,908,011, Cl. 600-12.000.

Lankford, Bradley L.: *See*—
Hackemesser, Larry G.; and Lankford, Bradley L., 4,908,121, Cl. 208-85.000.

Lapshina, Nadezhda V.: *See*—
Kozachevsky, Gennady G.; Guskov, Valery V.; Boikov, Vladimir P.; Gorodnichev, Jury N.; Sizova, Svetlana I.; Moroz, Viktor A.; Kachur, Isaak Y.; Kholmovsky, Alexandr S.; and Lapshina, Nadezhda V., 4,908,090, Cl. 156-446.000.

Largman, Theodore; Mares, Frank; and Rodman, Clarke A., to Allied-Signal Inc. Fibers and filters containing said fibers. 4,908,052, Cl. 55-486.000.

Larson, Duane B.; and Korzow, Nick, Jr., to Bethlehem Steel Corporation. Apparatus and method for adaptive control of a rolling mill. 4,907,433, Cl. 72-8.000.

Laserdrive Limited: *See*—
Champagne, Patrick J.; and Grimsley, John L., 4,908,816, Cl. 369-215.000.

Lassman, Steven J.: *See*—
Call, David B.; Nolan, James A.; and Lassman, Steven J., 4,907,449, Cl. 73-170.00R.

Latta, Charles J.: *See*—
Miller, Theodore E., Jr.; Sutton, Tonja R.; and Latta, Charles J., 4,908,168, Cl. 264-40.100.

Lau, Robert G., to Whirlpool Corporation. Storage bin mounting system for a refrigerator and method of assembly. 4,908,544, Cl. 312-321.500.

Laurent, Sebastian M.; and Sanders, Robert N., to Ethyl Corporation. Zeolites in poultry nutrition. 4,908,218, Cl. 426-2.000.

Lavalou, Jean-Pierre M.: *See—*
Masseron, Alain O. F.; and Lavalou, Jean-Pierre M., 4,907,768, Cl. 248-123.100.

Law Printing Company, Inc.: *See—*
Berman, Sidney A., 4,907,359, Cl. 40-299.000.

Lawrie, William E.; and Petrak, Daniel R., to Babcock & Wilcox Company, The. Ceramic delay lines for hot ultrasonic examination. 4,907,455, Cl. 73-644.000.

Le Boudec, Gilles: *See—*
Arditty, Herve ; Le Boudec, Gilles; Graindorge, Philippe; Gerardin, Jean-Pierre; Lesne, Jean-Louis; and Meyet, Dominique, 4,907,878, Cl. 356-128.000.

Leclear, Douglas D.: *See—*
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 4,907,419, Cl. 62-263.000.

Lederis, Karl P.; McMaster, Denis; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. Urotensin peptides. 4,908,352, Cl. 514-12.000.

Lederman, Norman. Induction-based assistive listening system. 4,908,869, Cl. 381-79.000.

Lee, Chi-Long; and Gornowicz, Gerald A., to Dow Corning Corporation. Matrix for release of active ingredients. 4,908,208, Cl. 424-409.000.

Lee, Donald V.; and Ermis, Julius C. Board game for playing crossword puzzles. 4,907,807, Cl. 273-240.000.

Lee, Douglas W.: *See—*
Stangl, Gerald A.; Lee, Douglas W.; and Wilson, Dirk A., 4,907,658, Cl. 175-19.000.

Lee, George F.: *See—*
McAninh, Larry H.; Addy, Tralance O.; and Lee, George F., 4,908,163, Cl. 264-12.000.

Lee, Len F.: *See—*
Chupp, John P.; Lee, Len F.; Goure, William F.; and Molyneaux, John M., 4,908,057, Cl. 71-92.000.

Lee, Miko. Key manufacturing machine. 4,907,919, Cl. 409-81.000.

Lee, Robert D.; Kurkowski, Hal; and Bolan, Michael L., to Dallas Semiconductor Corporation. Registered outputs for a memory device. 4,908,796, Cl. 365-189.050.

Lee, Robert S.: *See—*
Davies, James F.; Lee, Robert S.; Travill, Andrew W.; and Williams, Robert J., 4,908,159, Cl. 252-559.000.

Lee, Sangchin. Pinion gear assembly for translating reciprocating movements of the pistons in the cylinders of an internal combustion engine into the rotating movement of a shaft. 4,907,548, Cl. 123-56.0AC.

Leemans, Luc E.; Uytterhoeven, Herman J.; Teyssie , Philippe J.; Fayt, Roger M.; and de Jaeger, Nikolaas C., to Agfa-Gevaert, N.V. Polymeric surfactant. 4,908,155, Cl. 252-353.000.

Leetmaa, Juri G.: *See—*
Basil, Richard V., Jr.; and Leetmaa, Juri G., 4,908,589, Cl. 333-106.000.

Legros, Francois A.: *See—*
Dalle, Bernard M.; Caillot, Claude; and Legros, Francois A., 4,908,156, Cl. 252-511.000.

Lehle, Erhard, to D.I.E.N.E.S. Apparatebau GmbH. Device for speed control of an asynchronous motor. 4,908,564, Cl. 318-807.000.

Leibe, Gerhard; Kuhlmann, Klaus; and Weiss, Albert, to Siemens Aktiengesellschaft. Communications system comprising a ring-shaped network which is provided so as to provide a communications network in the subscriber line region of a digital switching equipment. 4,908,824, Cl. 370-85.150.

Leibhard, Erich, to Hilti Aktiengesellschaft. Method of securing anchor rods. 4,907,917, Cl. 405-261.000.

Leininger, Peter A.; and Hajianpour, Mohamad A., to Kinetic Concepts, Inc. Heat exchange system for inflatable patient support appliances. 4,907,308, Cl. 5-455.000.

Leis, Michael; Muchnik, Michael J.; Simmons, Elmer; Brown, Russell; and Rub, Bernardo, to Digital Equipment Corporation. Data decoding circuit including phase-locked loop timing. 4,908,841, Cl. 375-81.000.

Leisz, Dennis J.: *See—*
Box, Gary W.; Foote-Lennox, Thomas S.; Herreid, Rodney G.; Hoff, James F.; Leisz, Dennis J.; Perlick, John A.; Steeden, Terry T.; Turner, John J.; and Alexander, Curtis R., 4,908,784, Cl. 364-569.000.

Leitz, Edgar; Eichenauer, Herbert; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Mixtures of aromatic polycarbonates and/or aromatic polyesters with special copolymers. 4,908,416, Cl. 525-411.000.

Leitz, Edgar; Eichenauer, Herbert; Ott, Karl-Heinz; Eckel, Thomas; Peters, Horst; and Schoeps, Jochen, to Bayer Aktiengesellschaft. Thermoplastic molding compounds containing aliphatic polycarbonates. 4,908,422, Cl. 527-67.000.

Leitzen, Juergen: *See—*
Holze, Joachim; Kik, Michael; Leitzen, Juergen; Korn, Helmut; Plotsch, Hans; and Meschler, Leo, 4,907,398, Cl. 53-443.000.

Leliakov, Igor P.: *See—*
Crill, Philip D.; and Leliakov, Igor P., 4,908,776, Cl. 364-509.000.

Lemense, Rodney A., to A.O. Smith Corporation. Water heater with skirt ring dam. 4,907,569, Cl. 126-373.000.

Lemense, Rodney A., to A.O. Smith Corporation. Water heater with upwardly sliding outer jacket. 4,907,570, Cl. 126-373.000.

Lemercier, Frederic: *See—*
Saby, Gerard; and Lemercier, Frederic, 4,907,675, Cl. 182-178.000.

Leonard, Donald A.; and Sweeney, Harold E., to GTE Government Systems Corporation. High resolution interferometer with high etendue. 4,907,887, Cl. 356-352.000.

Leonard, Robert E., to Kerr-McGee Coal Corporation. Soot removal from exhaust gas. 4,908,047, Cl. 55-10.000.

Leonardi, David. Eyelid splint with replaceable pad. 4,907,580, Cl. 128-163.000.

Lepper, Larry G., to Cemen-Tech, Inc. Portable-concrete mixing device and method for using same. 4,907,890, Cl. 366-27.000.

Lermat, Yves: *See—*
Boutillier, Jacques; Forichon, Noelle; and Lermat, Yves, 4,908,408, Cl. 525-124.000.

Lerner, Terry, to Integrated Genetics, Inc. Nucleic acid extraction methods. 4,908,318, Cl. 435-270.000.

Les Produits Associes LPA-Broxo S.A.: *See—*
Jousson, Pierre-Jean, 4,907,744, Cl. 239-449.000.

Lesne, Jean-Louis: *See—*
Arditty, Herve ; Le Boudec, Gilles; Graindorge, Philippe; Gerardin, Jean-Pierre; Lesne, Jean-Louis; and Meyet, Dominique, 4,907,878, Cl. 356-128.000.

Leuck, Hans; and Westermann, Hans-Jorg, to Huels Troisdorf AG. Method for the production of benzene carboxylic acids and benzene dicarboxylic acid esters. 4,908,471, Cl. 560-77.000.

Lever Brothers Company: *See—*
Davies, James F.; Lee, Robert S.; Travill, Andrew W.; and Williams, Robert J., 4,908,159, Cl. 252-559.000.
Hessel, John F.; Card[illegible]li, Martin S.; and Aronson, Michael P., 4,908,150, Cl. 252-174.120.

Levine, Jon D.; and Basebaum, Allan I., to University of California, The Regents of the. Use of $beta_2$ antagonists in the treatment of inflammatory diseases, in particular, rheumatoid arthritis. 4,908,387, Cl. 514-653.000.

Levine, Michael R. VCR Programmer. 4,908,713, Cl. 358-335.000.

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Lewis, John: *See—*
Polonio, John D.; Penney, Bruce J.; and Lewis, John, 4,908,621, Cl. 341-120.000.

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Walde, Michael; Zeidler, Peter; and Domroese, Dirk, 4,907,526, Cl. 118-50.000.

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Palusamy, Sam S.; Schmertz, John C.; Li, Dali; Chirigos, John N.; Bond, Charles B.; and Yang, Chuang Y., 4,908,775, Cl. 364-508.000.

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Matlock, Dyer A.; Lichtel, Richard L., Jr.; and Pearce, Lawrence G., 4,908,683, Cl. 357-23.110.

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Focke, Heinz; and Liedtke, Kurt, 4,907,607, Cl. 131-280.000.
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Lorincz, Attila T., 4,908,306, Cl. 435-5.000.

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Reich, Richard M.; and Devlin, Phillip H., 4,908,602, Cl. 340-514.000.

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Ericsson, Sylve J. D.; and Lindstrom, Nils A. E., 4,907,505, Cl. 101-114.000.

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Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., to Vent-Plant Corporation, Inc. Method of manufacturing synthetic bone coated surgical implants. 4,908,030, Cl. 623-16.000.

Linnoila, Markku I.: *See*—
Jacobson, Kenneth A.; Kirk, Kenneth L.; Linnoila, Markku I.; Miller, Thomas; and Mine, Kazunori, 4,908,322, Cl. 436-111.000.

Linssen, Mathias: *See*—
Aichele, Karl; Kramer, Wolfgang; Lang, Ernst; Linssen, Mathias; Stemmer, Alois; and Wissmann, Michael, 4,907,746, Cl. 239-472.000.

Lion Corporation: *See*—
Takizawa, Masahiro; and Takahashi, Hideyuki, 4,908,233, Cl. 427-213.350.

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Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred, 4,908,173, Cl. 264-63.000.

Lisowski, Adam, to International Fashion Garments Ltd. Convertible pants/minishorts. 4,907,298, Cl. 2-212.000.

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Little Suamico Products Inc.: *See*—
Helmle, Fred J.; and Helmle, Scott M., 4,907,538, Cl. 119-51.010.

Little, Wendell L.; and Grider, Stephen N., to Dallas Semiconductor Corporation. Backup battery switching circuitry for a microcomputer or a microprocessor. 4,908,790, Cl. 364-900.000.

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Pavlath, George A., 4,907,848, Cl. 350-3.750.
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Litzaw, Edgar M. Contact lens cleaning device. 4,907,613, Cl. 134-158.000.

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Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,908,409, Cl. 528-188.000.

Lloyd, Stephen F., to Herrera, Giselle Mary, a part interest. Drill pipe tubing and casing protectors. 4,907,661, Cl. 175-325.000.

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Apsell, Sheldon P.; and Stapelfeld, Norval D., 4,908,629, Cl. 342-457.000.

Lo, Peter Y. K., to Dow Corning Corporation. Dioxolane, diol and diacrylate silicon compounds and method for their preparation and use. 4,908,228, Cl. 427-54.100.

Loctite (Ireland) Ltd.: *See*—
Harris, Stephen J.; MacManus, Maureen G.; and Guthrie, John, 4,908,399, Cl. 524-243.000.

Loder, Harry A.: *See*—
Miles, Alden R.; Schwandt, Theodore F.; Nygard, James C.; Loder, Harry A.; and Emmel, John J., 4,907,825, Cl. 281-51.000.

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Radovic, Milorad; Mirkovich, John; and Loncarski, Boja J., 4,907,317, Cl. 17-16.000.

Long, David E. Infrared radiation powered lightweight aircraft. 4,907,764, Cl. 244-62.000.

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DeBoer, Charles; and Long, Michael, 4,908,631, Cl. 346-76.00R.

Loomans, Bernard A.; Kowalczyk, James E.; Lange, Harold A.; and Jones, Jerry W., to APV Chemical Machinery Inc. Method of continuously carbonizing a mixture of primarily organic waste material. 4,908,104, Cl. 201-25.000.

Lord Corporation: *See*—
Wolfe, Paul T.; Nobles, Charles M.; and Miller, Lane R., 4,907,680, Cl. 188-299.000.

Lordo, Robert E.; and McSparran, Lloyd W., to Contraves Goerz Corporation. Spherical motion simulator. 4,908,558, Cl. 318-648.000.

Lorence, Brian S.; and Phelps, Richard A., to Chivas Products Limited. Container holder. 4,907,775, Cl. 248-311.200.

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Kwon, Ik B.; Park, Hyung H.; and An, Bong J., 4,908,212, Cl. 424-440.000.

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Bouiller, Jean G.; Jourdain, Gerard E. A.; and Loubet, Marc G., 4,907,743, Cl. 239-265.110.

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Louden, Peter J.: *See*—
Baker, Thomas M.; Dunn, Michael T.; Duven, Jeffrey E.; Hackler, Jim W.; Louden, Peter J.; and Schjoneman, Clifford M., 4,908,618, Cl. 340-945.000.

Loza, Roman; and Cyngier, Roseann M., to Standard Oil Company, The. C-branched zwitterionic surfactants and enhanced oil recovery method using same. 4,908,141, Cl. 252-8.554.

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Breen, Brian E.; and Harris, Ian R., 4,908,599, Cl. 338-22.00R.

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McCann, Denis J.; Williams, Allan; Carswell, Edwin R.; and Broome, William S., 4,907,843, Cl. 303-111.000.

Urban, John A., 4,907,678, Cl. 188-78.000.

Lucking, Lawrence M.: *See*—
Mikelsons, Valdis; Lucking, Lawrence M.; and Zwadlo, Gregory L., 4,907,532, Cl. 118-659.000.

Ludikhuize, Adrianus W.; van Mil, Job F. P.; and Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. DC/AC bridge circuit. 4,908,551, Cl. 315-209.00R.

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Jensen, Svend A.; and Haagensen, Peter, 4,908,703, Cl. 358-106.000.

Lummus, A. D.: *See*—
Knudsen, David S., 4,907,392, Cl. 53-138.00A.

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Lund, Svend A.; and Kristensen, Willy D., to Akademiet for De Tekniske Videnskaber. System for ultrasonic examination. 4,908,774, Cl. 364-507.000.

Lund, Wesley C.; and Pedersen, Dan E., to Boeing Company, The. Milling cutter for honeycomb core material. 4,907,920, Cl. 409-132.000.

Lundahl, Lief; and Wikstrom, Christer, to Misomex Aktiebolag. Burnout frame for a copy print machine. 4,908,658, Cl. 355-76.000.

Lunts, Lawrence H. C.: *See*—
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; Campbell, Ian B.; Middlemiss, David; and Willbe, Charles, 4,908,386, Cl. 514-605.000.

Luschnig, Franz: *See*—
Wittmann, Heinz; Stritzl, Karl; Luschnig, Franz; Stanzl, Robert; and Himmetsberger, Alois, 4,907,353, Cl. 36-117.000.

Lusgen, Holger: *See*—
Dullings, Josef; Kloker, Werner; Freitag, Dieter; Lusgen, Holger; Schmid, Helmut; and Winchenbach, Helmut, 4,908,216, Cl. 425-3.000.

Lutomski, Kathryn A., to FMC Corporation. Photoactive azole pesticides. 4,908,357, Cl. 514-92.000.

Lutzke, John M. Mooring apparatus. 4,907,522, Cl. 114-230.000.

Lynne, Mark, to Empire Research and Development Corporation. Automobile gasoline impurities removal apparatus. 4,908,130, Cl. 210-172.000.

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Bennett, Christopher J.; Hobza, James M.; Katznelson, Ron D.; and Walker, Gordon K., 4,908,859, Cl. 380-10.000.

M. W. Kellogg Company, The: *See*—
Hackemesser, Larry G.; and Lankford, Bradley L., 4,908,121, Cl. 208-85.000.

Ma, Di; and Hoffman, David H., to Standard Microsystems Corporation. Process for fabricating self-aligned silicide lightly doped drain MOS devices. 4,908,326, Cl. 437-44.000.

Ma, Wai M.: *See*—
Dranchak, David W.; Engle, David E.; Hessian, David E.; Knight, Alan D.; Ma, Wai M.; Macek, Thomas G.; and Squires, John J., 4,907,975, Cl. 439-67.000.

Macaulay, Ewen D. M.: *See*—
Pickett, John A.; and Macaulay, Ewen D. M., 4,908,388, Cl. 514-716.000.

MacDonald, Scott A.: *See*—
Hefferon, George J.; Ito, Hiroshi; MacDonald, Scott A.; and Willson, Carlton G., 4,908,298, Cl. 430-313.000.

Macek, Thomas G.: *See*—
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Machida, Satoshi; Hasegawa, Shigekazu; Ota, Yoshimi; and Okamoto, Muneji, to Kubota Ltd. Change speed control structure for hydraulic transmission. 4,907,465, Cl. 74-89.200.

Machinefabriek C. Rijkaart B.V.: *See*—
Rijkaart, Cornelis, 4,907,501, Cl. 99-450.100.

Mackenzie, James M. W.; and Cabassi, Peter J., to Henkel Kommanditgesellschaft auf Aktien. Froth flotation process for the recovery of minerals and a collector composition for use therein. 4,908,125, Cl. 209-166.000.

Mackiewicz, Walter A.: *See*—
Alexander, Everett L., Jr.; Carlin, Allan R.; Fiore, Alice L.; and Mackiewicz, Walter A., 4,908,759, Cl. 364-300.000.

MacLean-Fogg Company: *See*—
Hellon, Keith, 4,907,924, Cl. 411-303.000.

MacManus, Maureen G.: *See*—
Harris, Stephen J.; MacManus, Maureen G.; and Guthrie, John, 4,908,399, Cl. 524-243.000.

MacMillan, William R., to Tilghman Wheelabrator Ltd. Shot blasting machinery. 4,907,379, Cl. 51-426.000.

MacMunn, William G. Three-dimensional signage. 4,907,360, Cl. 40-552.000.

Madokoro, Shinichi: *See*—
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, 4,908,590, Cl. 333-183.000.

Maeda, Hiroshi: *See*—
Cullen, Walter P.; Oscarson, John R.; Tone, Junsuke; and Maeda, Hiroshi, 4,908,316, Cl. 435-253.400.

Maeda, Kannosuke; and Aoyama, Toshio, to Sankyo Kasei Co., Ltd. Method of producing crystals of anhydrous sodium sulfide. 4,908,043, Cl. 23-302.00T.

Maeda, Toshiyuki: *See*—
Otawa, Yasuhiko; Maeda, Toshiyuki; Hiraoka, Kunihide; and Okamoto, Katsuo, 4,908,412, Cl. 525-286.000.

Maeda, Yasunori: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Maehata, Hiromi: *See*—
Sakai, Kazunori; Wakabayashi, Shinji; and Maehata, Hiromi, 4,908,572, Cl. 324-173.000.

Maekawa, Yoshio: *See*—
Okumura, Minoru; Maekawa, Yoshio; Mizuno, Hironori; and Yagiyu, Osamu, 4,908,373, Cl. 514-327.000.

Maekawa, Yukihiro: *See*—
Hoshino, Ikuya; Kimura, Hiroshi; Maekawa, Yukihiro; and Fujimoto, Takayuki, 4,907,434, Cl. 72-8.000.

Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; and Torichigai, Masaaki, to Kansai Electric Power Co., Inc., The; and Mitsubishi Jukogyo Kabushiki Kaisha. Cleaning system for a horizontal type tube assembly. 4,907,542, Cl. 122-379.000.

Maglio, Murrill W.; and Moore, Stephen D., to Universal Chemical Feeder, Inc. Chemical dispensing device. 4,908,190, Cl. 422-276.000.

Magnavox Government and Industrial Electronics Company: *See*—
Richeson, Willian E., Jr., 4,908,731, Cl. 361-159.000.

Magnetic Peripherals Inc.: *See*—
Krum, Richard G.; and Bucknam, Neil E., 4,908,715, Cl. 360-97.020.

Magnusson, Lennart: *See*—
Stake, Esbjorn; and Magnusson, Lennart, 4,907,697, Cl. 206-446.000.

Mahanay, Herbert S.; and Hoeffken, Russell W., to Snyder General Corporation. Dual wall evaporator pan. 4,907,420, Cl. 62-291.000.

Maher, Galeb H.: *See*—
Ross, Sidney D.; Maher, Galeb H.; and Hutchins, Clinton E., 4,908,338, Cl. 501-1.000.

Mahjour, Majid; Iyer, Uma; and Fawzi, Mahdi B., to Warner-Lambert Company. Penetration enhancement system. 4,908,389, Cl. 514-772.000.

Mahler, Walter: *See*—
Bolt, John D.; Mahler, Walter; Tebbe, Frederick N.; and Young, Robert J., Jr., 4,908,197, Cl. 423-412.000.

Mai, Martin. Paraocclusive dental instrument. 4,907,967, Cl. 433-73.000.

Maier, Elmar, to Hilti Aktiengesellschaft. Drilling tool. 4,907,663, Cl. 175-330.000.

Maier, Lawrence C., to Simmonds Precision Products, Inc. Apparatus and method for determining liquid levels. 4,908,783, Cl. 364-560.000.

Maillefer, Jean-Claude, to Cybelec S.A. Safety device for a press brake or similar machine. 4,907,432, Cl. 72-1.000.

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Sterzel, Hans-Josef; and Mair, Gunther, 4,908,172, Cl. 264-63.000.

Maistre, Francois: *See*—
Modot, Marcel; De Lapasse, Philippe; and Maistre, Francois, 4,908,219, Cl. 426-15.000.

Majima, Osamu; Kakinuma, Koichiro; Naganuma, Tohru; and Ando, Makoto, to Sony Corporation. Electronic writing board. 4,908,711, Cl. 358-296.000.

Makabe, Takahiro: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.

Makino, Hideaki: *See*—
Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; Anzai, Hisao; and Makino, Hideaki, 4,908,402, Cl. 524-495.000.

Makishima, Reichi: *See*—
Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, 4,907,830, Cl. 285-91.000.

Makus, Sharon J.; and Bennett, Warren L. Article and method for wood preservative treatment. 4,908,085, Cl. 156-215.000.

Malachowsky, Chris: *See*—
Priem, Curtis; Webber, Thomas; and Malachowsky, Chris, 4,908,780, Cl. 364-521.000.

Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Modified polytetrafluoroethylene fine powder and preparation thereof. 4,908,410, Cl. 525-276.000.

Mallinckrodt, Inc.: *See*—
Stepaniuk, Nickolas J.; and Lamb, Bruce J., 4,908,270, Cl. 423-386.000.

Mallory, Chester L.; Tong, Edric H.; and Borglum, Wayne K., to Prometrix Corporation. Apparatus for handling semiconductor wafers. 4,907,931, Cl. 414-225.000.

Maltry, Werner: *See*—
Lach, Dietrich; Eckert, Guenter; Maltry, Werner; and Fischer, Karl, 4,908,239, Cl. 427-389.000.

Mamiya Camera Co., Ltd.: *See*—
Masuda, Nobuyuki, 4,908,640, Cl. 354-75.000.

Man Gutehoffnungshutte GmbH: *See*—
Grathoff, Hartmut, 4,907,932, Cl. 414-140.900.

Manaka, Toshio; and Shida, Masami, to Hitachi, Ltd. Engine control apparatus. 4,907,558, Cl. 123-489.000.

Manion, Michael C.; and Ralph, Vernon C., to Honeywell Inc. High volume obturator assembly method. 4,907,513, Cl. 102-527.000.

Manitowoc Company, Inc., The: *See*—
Kohl, Vance L.; and Schlosser, Charles E., 4,907,422, Cl. 62-352.000.

Mankey, Harry S., to Standard Manufacturing Company, Inc. Cargo transporter. 4,907,935, Cl. 414-495.000.

Mannerud, Jack E.: *See*—
Nelson, James S.; Angell, Scott L.; Mannerud, Jack E.; and Bergman, Charles H., 4,907,533, Cl. 118-663.000.
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Mannesmann Aktiengesellschaft: *See*—
Dietzel, Hans-Ulrich; Dolch, Gernot; and Muffke, Walter, 4,907,326, Cl. 29-33.00T.

Mannio, Aaron, to Valmet Paper Machinery Inc. Apparatus for controlling the tilt angle of a doctor blade. 4,907,529, Cl. 118-126.000.

Mansuri, Muzammil M.: *See*—
Sterzycki, Roman Z.; Mansuri, Muzammil M.; and Martin, John C., 4,908,440, Cl. 536-23.000.

Maple, M. Brian: *See*—
Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, 4,907,731, Cl. 228-2.500.

Marathon Oil Company: *See*—
Plummer, Mark A., 4,908,064, Cl. 106-281.100.

Marchetti, Sergio, to Camar S.p.A. Tuck-up foot for furniture. 4,907,770, Cl. 248-188.600.

Mares, Frank: *See*—
Largman, Theodore; Mares, Frank; and Rodman, Clarke A., 4,908,052, Cl. 55-486.000.

Maresca, Louis M.: *See*—
Robeson, Lloyd M.; Winslow, Paul A.; Matzner, Markus; Harris, James E.; and Maresca, Louis M., 4,908,425, Cl. 528-125.000.

Marhic, Michel E., to Northwestern University. Single-mode 1×N holographic fiber optics coupler. 4,907,851, Cl. 350-96.190.

Marianowski, Leonard G.; and Remick, Robert J., to Institute of Gas Technology. Apparatus for the electrochemical separation of oxygen. 4,908,113, Cl. 204-243.00R.

Marion Laboratories, Inc.: *See*—
Martin, Daniel E., 4,908,469, Cl. 560-17.000.

Marion, Pierre: *See*—
Colon, Jean; and Marion, Pierre, 4,908,028, Cl. 623-2.000.

Marlow, Bruce J.; Oja, Tonis; and Goetz, Philip J., to Pen Kem, Inc. Colloid analyzer. 4,907,453, Cl. 73-584.000.

Marolda, Frank. Baby walking straps. 4,907,972, Cl. 434-255.000.

Marposs Societa per Azioni: *See*—
Dall'aglio, Carlo; Danielli, Franco; and Golinelli, Guido, 4,907,345, Cl. 33-544.300.

Marshall, Peter G.; and Feldstein, Robert, to Data General Corporation. System for controlling access to computer bus having address phase and data phase by prolonging the generation of request signal. 4,908,749, Cl. 364-200.000.

Marshall, Steven P.: *See*—
Pathak, Bimal; Marshall, Steven P.; and Potts, James F., 4,908,748, Cl. 364-200.000.

Martin, Chans A. Forced air induction system. 4,907,552, Cl. 123-198.00E.

Martin, Daniel E., to Marion Laboratories, Inc. 2-Hydroxy-propanoic acid acyclic alkyl esters for benzothiazepines. 4,908,469, Cl. 560-17.000.

Martin, Jean-Pierre; Dube, Ghyslain; and Doutre, Don A., to Alcan International Limited. Probe for the determination of gas concentration in molten metal. 4,907,440, Cl. 73-19.000.

Martin, John C.: *See*—
Sterzycki, Roman Z.; Mansuri, Muzammil M.; and Martin, John C., 4,908,440, Cl. 536-23.000.

Martin, Lawrence L.; and Payack, Joseph F., to Hoechst-Roussel Pharmaceuticals Inc. 1-aminoalkyl-3-oxysubstituted-4-aryl-1,3,4,5-tetrahydro-2H-1,3-benzodiazepine-2-ones. 4,908,360, Cl. 514-213.000.

Martin, Lawrence L.; and Allen, Richard C., to Hoechst-Roussel Incorporated. Tetrahydroisoquino[2,1-C](1,3)benzodiazepines. 4,908,361, Cl. 514-219.000.

Martin, Patrick E., to Johnson & Johnson Consumer Products, Inc. Electrothermal dental debracketing tool and method of removal. 4,907,965, Cl. 433-3.000.

Martinez, Louis, to Cooper Industries, Inc. Narrow band synchronized radio communication and alarm system. 4,908,600, Cl. 340-310.00R.

Martuscello, Peter J.; and Rittenhouse, Philip J., to Corning Incorporated. Temperature measuring device. 4,907,896, Cl. 374-190.000.

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Maru, Tsuguo, to NEC Corporation. Mobile telephone terminal having function to perform call clear process. 4,908,846, Cl. 379-58.000.

Maruta, Syuzi: *See*—
Ohira, Tadashi; and Maruta, Syuzi, 4,908,660, Cl. 355-206.000.

Marx, Hans-Norbert: *See*—
Goettsche, Reimer; and Marx, Hans-Norbert, 4,908,362, Cl. 514-231.200.

Marx, Martin: *See*—
Marx, Martin J.; Harper, Mark A.; and Halter, Todd D., 4,907,444, Cl. 73-60.100.

Marx, Martin J.; Harper, Mark A.; and Halter, Todd D., to Marx, Martin. Fire fighting foam analyzer and method therefor. 4,907,444, Cl. 73-60.100.

Maryanoff, Bruce E.; Maryanoff, Cynthia A.; McComsey, David F.; and Sorgi, Kirk L., to McNeilab, Inc. Certain hexahydro-6-arylpyrrolo[2,1-A]isoquinolines. 4,908,450, Cl. 546-94.000.

Maryanoff, Cynthia A.: *See*—
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Tsunashima, Kenji; Mimura, Takashi; Sumiya, Takashi; and Kuboyama, Hiroshi, 4,908,277, Cl. 428-480.000.
Mimura, Tsuyoshi: *See*—
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Minagawa, Koji: *See*—
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Minami, Mamoru: *See*—
Sudare, Masahiro; Tomikawa, Hisao; and Minami, Mamoru, 4,908,557, Cl. 318-587.000.
Minami, Syuji: *See*—
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Jacobson, Kenneth A.; Kirk, Kenneth L.; Linnoila, Markku I.; Miller, Thomas; and Mine, Kazunori, 4,908,322, Cl. 436-111.000.
Minnesota Mining and Manufacturing Company: *See*—
Bland, Ralph H.; Peper, William A.; and Stambaugh, Bruce D., 4,908,278, Cl. 428-500.000.
Delpato, Ivano, 4,908,302, Cl. 430-544.000.
Huppert, James C., 4,907,378, Cl. 51-330.000.
Mikelsons, Valdis; Lucking, Lawrence M.; and Zwadlo, Gregory L., 4,907,532, Cl. 118-659.000.
Miles, Alden R.; Schwandt, Theodore F.; Nygard, James C.; Loder, Harry A.; and Emmel, John J., 4,907,825, Cl. 281-51.000.
Reed, John F.; Meyer, Daniel E.; and Hanschen, Thomas P., 4,908,263, Cl. 428-286.000.
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Minohata, Masanori: *See*—
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Ito, Masazumi, 4,908,672, Cl. 355-311.000.
Karasaki, Toshihiko; and Sugitani, Kazumi, 4,908,504, Cl. 250-201.200.
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Kuroda, Muneo, 4,908,708, Cl. 358-206.000.
Matsui, Toru; and Karasaki, Toshihiko, 4,908,649, Cl. 354-403.000.
Muramatsu, Hideo, 4,908,673, Cl. 355-311.000.
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Uchiyama, Tadamitsu; and Iida, Tetsuya, 4,908,712, Cl. 358-298.000.
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Yamamoto, Masaaki, 4,908,669, Cl. 355-282.000.
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Takamatsu, Junichi; and Akiyama, Kazunori, 4,908,668, Cl. 355-274.000.
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Mitsubishi Denki K.K.: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Hata, Masayuki; and Nakagawa, Hiromasa, 4,908,690, Cl. 357-68.000.
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Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,556, Cl. 123-486.000.
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,557, Cl. 123-488.000.
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Inoue, Yoshiaki; and Komatsu, Toshio, 4,908,151, Cl. 252-188.280.

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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Mitsubishi Yuka Badische Co., Ltd.: *See*—
Arai, Masakazu; Endo, Hiroshi; Gotoh, Toshihiro; Yagi, Toshio; Tanaka, Masanori; Saito, Masanori; and Mathuno, Shigeki, 4,908,393, Cl. 521-60.000.
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Mitsui Petrochemical Industries, Ltd.: *See*—
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Mitsui Toatsu Chemicals, Inc.: *See*—
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Miyasaka, Tsutomu; Tani, Tadaaki; and Sugimoto, Tadao, to Fuji Photo Film Co., Ltd. Silver halide photographic materials spectrally sensitized with luminous dye. 4,908,303, Cl. 430-569.000.

Miyata, Junji: *See*—
Katoh, Kazunobu; Takagi, Yoshihiro; Kameoka, Kimitaka; Miyata, Junji; and Ukai, Toshinao, 4,908,293, Cl. 430-264.000.

Mizoguchi, Shoichi, to NEC Corporation. Correlation detecting circuit operable in a low frequency. 4,908,838, Cl. 375-15.000.

Mizohata, Tadashi; and Sakamoto, Daiji, to Futaba Denshi Kogyo Kabushiki Kaisha; and Hitachi Metals, Ltd. Fluorescent display device. 4,908,548, Cl. 313-497.000.

Mizuno, Hironori: *See*—
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Chou, Tai-sheng; and Kiliany, Thomas R., Jr., 4,908,136, Cl. 210-661.000.
Davis, Robert H.; Farng, Liehpao O.; and Horodysky, Andrew G., 4,908,144, Cl. 252-47.500.
Givens, Wyatt W., 4,907,448, Cl. 73-153.000.
Jones, Timothy A.; and Kaluza, Thomas J., 4,907,442, Cl. 73-38.000.
McWilliams, John P.; and Sigal, Catherine T., 4,908,342, Cl. 502-68.000.
Pruden, Ann L.; Venkat, Chaya; and Whitehurst, Darrell D., 4,908,341, Cl. 502-30.000.
Sanchez, J. Michael; Strom, E. Thomas; Shu, Paul; and Alameddine, Bassem R., 4,907,656, Cl. 166-270.000.
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Modot, Marcel; De Lapasse, Philippe; and Maistre, Francois, to Societe Cooperative Agricole de Canet. Process for fermentation. 4,908,219, Cl. 426-15.000.

Moerker, Theophile; and Peter, Heinrich, to Ciba-Geigy Corporation. Esterified hydroxy dihydropyridinones for treating diseases associated with trivalent metal ion overload. 4,908,371, Cl. 514-318.000.

Moghe, Sanjay B.: *See*—
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Mohr, Max: *See*—
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Moise, John C.; Wampler, Richard K.; and Butler, Kenneth C., to Nimbus Medical, Inc. Chronic ventricular assist system. 4,908,012, Cl. 600-16.000.

Molex Incorporated: *See*—
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Dolan, Jerome; Wanha, Christopher; and Wright, Steven F., 4,907,343, Cl. 29-707.000.
Shah, Hasmukh; Zielke, Henry; Patterson, Richard L.; and Pellegrino, Thomas P., 4,907,324, Cl. 29-33.00M.

Molitor, Gerald R.; and Bidigare, Richard G., to Micromatic Operations Inc. Cylinder bore finishing apparatus tilt fixture. 4,907,372, Cl. 51-38.000.

Molyneaux, John M.: *See*—
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Kinlen, Patrick J.; and Heider, John E., 4,908,117, Cl. 204-415.000.

Montanari, Dennis G.: *See*—
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Mooneyham, Gary L.: *See*—
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Moore, Patrick D.; Rolen, Jack L.; and Cote , Linda G., to Milliken Research Corporation. Cleaning composition for textiles containing sulfonated colorless dye site blocker. 4,908,149, Cl. 252-139.000.

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Moore, Steven M.: *See*—
Rose, Floyd D.; Moore, Steven M.; and Knotts, Richard W., 4,907,483, Cl. 84-726.000.

Moore, Thomas R. Aeration device. 4,908,131, Cl. 210-219.000.

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Morgan, Michael J.: *See*—
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Mori, Masaharu; Hamatsu, Masahiro; and Akazawa, Shigeo, to Clarion Co., Ltd. Receiver for spread spectrum communication. 4,908,837, Cl. 375-1.000.

Mori, Sanae, to Daido Metal Company, Ltd. Wrapped bush having identical joint portions in ends joined at joint. 4,907,626, Cl. 138-156.000.

Mori, Toshihiro: *See*—
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Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, to Hitachi, Ltd. Cooling apparatus and semiconductor device employing the same. 4,908,695, Cl. 357-81.000.

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Morimoto, Hideaki; and Funayama, Kiyoshi, to NEC Corporation. Channel switching system. 4,908,839, Cl. 375-40.000.

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Morita, Kenichi; and Shimizu, Yoshihiro, to Toray Industries, Inc. Minute electrode for electrochemical analysis. 4,908,115, Cl. 204-294.000.

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Moriyasu, Takashi; and Mizutani, Hiroyuki, to Kabushiki Kaisha Toshiba. Inductive inference method for obtaining rules represented by propositional logic. 4,908,778, Cl. 364-513.000.

Moroz, Viktor A.: *See*—
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Moser, Roland: *See*—
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Moskal & Chilewich, Inc.: *See*—
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Moskal, Kathy: *See*—
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Lund, Clarence A.; and Hamzik, Richard R., 4,908,688, Cl. 357-41.000.
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Walker, John S., 4,907,713, Cl. 220-76.000.

Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Flexible circuit and connector assembly. 4,908,336, Cl. 439-496.000.

Mount Sinai School of Medicine of the City of New York, The: *See*—
Sanders, Ira, 4,907,602, Cl. 128-787.000.

Moya, Edward: *See*—
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MTS Systems Corporation: *See*—
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Mulhaupt, Rolf; Simon, Hubert; and Cotting, Jacques-Alain, to Ciba-Geigy Corporation. Curable mixture. 4,908,406. Cl. 525-64.000.

Mullay, John J.; and Sohara, Joseph A., to Atlas Powder Company. Stable fluid systems for preparing high density explosive compositions. 4,907,368, Cl. 44-51.000.

Muller, Jurgen: *See*—
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Muller, Mark W. Adapter for station protector. 4,907,986, Cl. 439-535.000.

Muller, Werner; Hensel, Marie-Claude; and Huber, August, to Sulzer Brothers Limited. Holder for a vein segment and method of removing cells from a vein segment. 4,908,013, Cl. 600-36.000.

Mullner, Josef: *See*—
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Muneki, Koichiro: *See*—
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Mura, Shinichiro, to Fuji Jukogyo Kabushiki Kaisha. Power transmitting system for a four-wheel drive vehicle. 4,907,472, Cl. 475-89.000.

Murakami, Hajime: *See*—
Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, 4,908,667, Cl. 355-256.000.

Murakami, Noboru: *See*—
Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, 4,907,956, Cl. 425-110.000.

Murakami, Nobuaki; and Hirako, Osamu, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air/fuel ratio controller for engine. 4,908,765, Cl. 364-431.050.

Murakami, Osamu: *See*—
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Murakami, Tsutomu: *See*—
Arai, Takayoshi; Kanai, Masahiro; Kawakami, Soichiro; and Murakami, Tsutomu, 4,908,330, Cl. 437-170.000.
Kanai, Masahiro; Murakami, Tsutomu; Arai, Takayoshi; and Kawakami, Soichiro, 4,908,329, Cl. 437-101.000.

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Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi. Pyrimidine compounds as antagonists of SRS-A. 4,908,368, Cl. 514-256.000.

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Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, 4,908,590, Cl. 333-183.000.

Murata, Yasuhiko: *See*—
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Murayama, Seiichi: *See*—
Okamoto, Yukio; and Murayama, Seiichi, 4,908,492, Cl. 219-121.520.

Murooka, Hideyasu; Kyooi, Masayuki; Yamada, Osamu; and Ujiie, Noriaki, to Hitachi, Ltd. Method of forming a multilayer printed circuit board and apparatus therefor. 4,908,087, Cl. 156-286.000.

Murtaugh, Pamela H.; and Murtaugh, Timothy J. Oat or rice based frozen dessert and method for preparation. 4,908,223, Cl. 426-565.000.

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Murtaugh, Pamela H.; and Murtaugh, Timothy J., 4,908,223, Cl. 426-565.000.

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Mutec Ingenierie: *See*—
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Muz, Edwin, to Nicolay GmBH. Method for the determination of the saturation of the blood of a living organism with oxygen and electronic circuit for performing this method. 4,907,594, Cl. 128-633.000.

Muzzarelli, Marco F., to I.De.A. S.p.A. Institute Of Development In Automotive Engineering. Transmission for a four-wheel drive motor vehicle. 4,907,672, Cl. 180-233.000.

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Nabeshima, Hiroichi: *See*—
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Nadeau, Paul G.: *See*—
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Naef, Rudolf; and Eckhardt, Claude, to Ciba-Geigy Corporation. Anionic cyclodiylide compounds, their preparation and use in washing agents as shading dyes. 4,908,040, Cl. 8-137.000.

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Goertz, Hans-Helmut; Straub, Ferdinand; Vogel, Friedrich; Frosch, Franz; Naegele, Paul; and Raubenheimer, Hans-Juergen, 4,908,413, Cl. 525-304.000.

Nagano, Hidenobu: *See*—
Taniguchi, Manabu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, 4,907,460, Cl. 73-862.330.

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Naganuma, Yoshio: *See*—
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.

Nagasaka, Hideo: *See*—
Niimura, Isao; Nagasaka, Hideo; Takeuchi, Manabu; Nita, Toshiyuki; and Suzuka, Susumu, 4,908,225, Cl. 427-25.000.

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Nagasawa, Tsuyoshi: *See*—
Ohyama, Masao; and Nagasawa, Tsuyoshi, 4,908,723, Cl. 360-85.000.

Nagashima, Tsuneo; and Yamane, Makoto, to Tabai Espec Co. Ltd.; Itoman & Co. Ltd.; and Uchida, Taichi. Oil mist remover. 4,908,050, Cl. 55-400.000.

Nagata, Syoichi: *See*—
Ohashi, Kunio; and Nagata, Syoichi, 4,908,633, Cl. 346-107.00R.

Nagi, Katsuo, to Yamaha Corporation. Motional load driver. 4,908,870, Cl. 381-96.000.

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Naitoh, Shigeki: *See*—
Shiomi, Yutaka; Kamio, Kunimasa; Haraguchi, Satoru; and Naitoh, Shigeki, 4,908,417, Cl. 525-422.000.

Nakagawa, Hiromasa: *See*—
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Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,908,651, Cl. 354-434.000.
Koike, Norio; Ozaki, Toshifumi; Nakai, Masaaki; Ando, Haruhisa; Ohba, Shinya; Ono, Hideyuki; Akimoto, Hajime; and Kinugasa, Hajime, 4,908,684, Cl. 357-24.000.

Nakaji, Norman K. Supine support device and method for treatment and prevention of malocclusion of the teeth. 4,907,306, Cl. 5-436.000.

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Nakajiri, Takashi: *See*—
Kotani, Matahira; Hachinoda, Masayuki; Matsuda, Toshihiro; Nakajiri, Takashi; and Hayashi, Motohiko, 4,908,851, Cl. 379-100.000.

Nakamura, Kiyoshi: *See*—
Kusaka, Kazuo; Suehiro, Shigeo; Tajiri, Noboru; Nakamura, Kiyoshi; and Okimoto, Tsuyoshi, 4,907,784, Cl. 266-235.000.

Nakamura, Kouji; Ohshima, Yukiji; and Kamio, Hajime, to Oshida Patent Agency. Scroll made of aluminum alloy. 4,908,077, Cl. 148-437.000.

Nakamura, Shinichi; and Shibue, Toshiaki, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive element. 4,908,304, Cl. 430-615.000.

Nakamura, Shirou: *See*—
Yamada, Tadatoshi; Iwamoto, Masatami; Ohara, Akinori; Nakamura, Shirou; and Yamamoto, Yuuichi, 4,908,580, Cl. 328-235.000.

Nakamura, Yasutaka: *See*—
Takeda, Fuchio; Nojima, Kazuo; and Nakamura, Yasutaka, 4,908,665, Cl. 355-245.000.

Nakano, Hisazi: *See*—
Aramaki, Minoru; Nakano, Hisazi; and Kubo, Masahiro, 4,908,415, Cl. 525-356.000.

Nakashima, Mitsuyoshi; and Tsurusaki, Satoshi. Cooling device for cooling parts in the proximity thereof. 4,908,248, Cl. 428-355.000.

Nakashima, Tai; and Kitagawa, Tadao, to Honda Giken Kogyo Kabushiki Kaisha. Centralized lock device for vehicle storage container. 4,907,428, Cl. 70-264.000.

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Satoh, Yoshiaki; Nakashima, Yasutaka; Enomoto, Kanehiko; Fujiwara, Atsushi; and Doi, Toshiaki, 4,908,313, Cl. 435-129.000.

Nakasone, Takayoshi; and Yasuda, Kazuo, to Ube-Nitto Kasei Co., Ltd. Spacer for carrying optical fibers. 4,907,854, Cl. 350-96.230.

Nakatani, Shigeki: *See*—
Sakono, Takashi; Inoue, Yasushi; and Nakatani, Shigeki, 4,907,551, Cl. 123-196.00R.

Nakatsuno, Eiji: *See*—
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Nakaya, Hiroaki: *See*—
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Nakayama, Akihiro; and Tachiki, Tomoko, to Kurokawa, Takio. Game kit utilizing board and pieces. 4,907,809, Cl. 273-242.000.

Nakayama, Hiroki: *See*—
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,907,866, Cl. 350-426.000.

Nakayama, Hiroshi: *See*—
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Nakayama, Hiroyuki: *See*—
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Nakayama, Kazunari: *See*—
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Nakayama, Muneo: *See*—
Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, 4,908,065, Cl. 106-287.240.

Nakayama, Nobuhiro: *See*—
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Nakayama, Yoshiaki: *See*—
Ueda, Shinichi; Ohtaka, Michihiro; Nakayama, Yoshiaki; Shinba, Hiroaki; and Ichikawa, Hiroshi, 4,907,836, Cl. 276-39.100.

Nakazawa, Kazuhiro: *See*—
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Namikawa, Osamu: *See*—
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Nanishi, Kiyoshi; and Nakayama, Hiroyuki, to Kansai Paint Co., Ltd. Antifouling coating. 4,908,061, Cl. 106-18.310.

Nantin, Hans: *See*—
Traegaardh, Paul; and Nantin, Hans, 4,908,091, Cl. 156-502.000.

Narang, Subhash C.; and Ventura, Susanna, to General Petrochemical Industries, Limited. Tetra ketone porphyrin monomers and the process of preparation thereof. 4,908,442, Cl. 540-145.000.

Narato, Kiyoshi: *See*—
Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, 4,907,962, Cl. 431-174.000.

Narusawa, Sadayuki: *See*—
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Nash, Stephen E.; and Pichler, Gerald P., to Federal-Mogul Corporation. Stretchable oil seal and method of installation. 4,907,811, Cl. 277-9.000.

Nasu, Nobuo, to Kabushiki Kaisha Kawakami Seisakusho. Apparatus for cutting laminated sheet material. 4,907,479, Cl. 83-422.000.

NaTec Mines Ltd.: *See*—
Hooper, Richard G., 4,908,194, Cl. 423-235.000.

National Gypsum Company: *See*—
Menchetti, Robert J.; and Chapman, Robert M., 4,907,773, Cl. 248-287.000.

National Research Development Corporation: *See*—
Brisdon, Brian J.; England, Richard; and Abed-Ali, Sera S., 4,908,135, Cl. 210-654.000.
Pickett, John A.; and Macaulay, Ewen D. M., 4,908,388, Cl. 514-716.000.
Shurmer, Harold V., 4,907,441, Cl. 73-23.000.
Weightman, Barry O.; and Wordsworth, Robert A., 4,908,034, Cl. 623-23.000.

National Semiconductor Corporation: *See*—
Goodrich, Gary B.; and Belani, Jadish G., 4,908,086, Cl. 156-181.000.
Hu, Chenming; and Sapp, Steven P., 4,908,328, Cl. 437-63.000.
Levit, Boris; and Millerick, Michael A. C., 4,907,612, Cl. 134-72.000.
Vora, Madhukar B.; and Hingarh, Hemraj K., 4,908,679, Cl. 357-15.000.

National Starch and Chemical Corp.: *See*—
Carter, David G.; Green, Derek J.; and Clark, Anthony J., 4,907,822, Cl. 281-15.100.
Mudge, Paul R., 4,908,268, Cl. 428-343.000.

Natori, Katsushi, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Image scanner using a rod-type light source. 4,908,717, Cl. 358-474.000.

Navistar International Transportation Corp.: *See*—
Tecco, Thomas C., 4,907,666, Cl. 180-89.200.

Naylor, Alan: *See*—
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; Campbell, Ian B.; Middlemiss, David; and Willbe, Charles, 4,908,386, Cl. 514-605.000.

Naylor, Brenda: *See*—
Naylor, Robert J.; and Naylor, Brenda, 4,908,370, Cl. 514-305.000.

Naylor, Robert J.; and Naylor, Brenda, to A. H. Robbins Company, Inc. Anxiolytic-n-(1-azabicyclo(2.2.2)oct-3-yl) benzamides and thiobenzamides. 4,908,370, Cl. 514-305.000.

NCR Corporation: *See*—
Mitchell, John G., 4,907,901, Cl. 400-157.200.
Porter, Warren W., 4,907,977, Cl. 439-74.000.

Ndebi, Sylvain L., to Eastman Kodak Company. Wick for fixing roller. 4,908,670, Cl. 355-284.000.

Neal, Brian P., to Bendix Limited. Spring force actuators. 4,907,496, Cl. 92-17.000.

Nearctic Research Centre: *See*—
Fry, Allan R., 4,908,486, Cl. 219-10.55A.

Neat, Robin J.: *See*—
Hooper, Alan; North, John M.; and Neat, Robin J., 4,908,284, Cl. 429-192.000.

Nebe, William J.; and Osborne, James J., to Du Pont de Nemours, E. I., and Company. Photosensitive semi-aqueous developable ceramic coating composition. 4,908,296, Cl. 430-281.000.

NEC Corporation: *See*—
Hiratsuka, Toshio, 4,907,853, Cl. 350-96.200.
Iwata, Tsukasa, 4,908,779, Cl. 364-518.000.
Kakimoto, Kazuo, 4,908,840, Cl. 375-60.000.
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Kawano, Osamu, 4,908,818, Cl. 370-15.000.

Maru, Tsuguo, 4,908,846, Cl. 379-58.000.
Mizoguchi, Shoichi, 4,908,838, Cl. 375-15.000.
Morimoto, Hideaki; and Funayama, Kiyoshi, 4,908,839, Cl. 375-40.000.
Takahashi, Mitsuasa, 4,908,682, Cl. 357-23.400.
Tanaka, Masami; and Nagasawa, Masataka, 4,907,447, Cl. 73-146.000.
Urai, Takahiko, 4,908,798, Cl. 365-230.030.
Yamaguchi, Takashi, 4,908,794, Cl. 365-189.080.

NEC Home Electronics Ltd.: *See*—
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Neff, Glenn C., to Combustion Tec, Inc. Burner bracket. 4,907,963, Cl. 431-189.000.

Nehezipari Muszaki Egyetem: *See*—
Turai, Endre, 4,908,622, Cl. 341-122.000.

Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, to United States of America, Energy. Dynamic high pressure process for fabricating superconducting and permanent magnetic materials. 4,907,731, Cl. 228-2.500.

Nelson, Eric L., to Nelson Research & Development Co. Article with microbiocidal solution. 4,908,262, Cl. 428-283.000.

Nelson, James R., to Union Carbide Chemicals and Plastics Company Inc. Process and reaction vessel for production of alkyl nitrite. 4,908,466, Cl. 558-488.000.

Nelson, James S.; Angell, Scott L.; Mannerud, Jack E.; and Bergman, Charles H., to BGK Finishing Systems, Inc. Automotive coating treatment apparatus with plural radiant lamps. 4,907,533, Cl. 118-663.000.

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Nelson, Larry G.: *See*—
Passamaneck, Richard S.; and Nelson, Larry G., 4,907,800, Cl. 273-26.00B.

Nelson Research & Development Co.: *See*—
Nelson, Eric L., 4,908,262, Cl. 428-283.000.

Nemoto, Akira, to Tachi-S Co., Ltd. Seat adjusting device. 4,907,776, Cl. 248-430.000.

Nemoto, Shusuke; Ishii, Norihiro; and Shimizu, Hiroaki, to Kanzaki Kokyukoki Mfg. Co., Ltd. Drive assembly for walking mowers. 4,907,401, Cl. 56-11.300.

Nerrinck, Bernard: *See*—
Benoit, Louis; and Nerrinck, Bernard, 4,907,354, Cl. 36-119.000.

Netzsch-Mohnopumpen GmbH: *See*—
Hantschk, Gunther, 4,907,906, Cl. 403-154.000.

Neumann, Peter: *See*—
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, 4,908,448, Cl. 544-289.000.

New England Machinery, Inc.: *See*—
Bankuty, Geza E.; Byron, LeRoy F.; and Cianciullo, Joseph J., 4,907,700, Cl. 209-546.000.

New York University: *See*—
Yip, Yam K., 4,908,432, Cl. 530-351.000.

Newell Co.: *See*—
Simon, Terry L., 4,907,636, Cl. 160-238.000.

Newlander, Kenneth A.: *See*—
Callahan, James F.; Huffman, William F.; Newlander, Kenneth A.; and Yim, Nelson C. F., 4,908,475, Cl. 560-115.000.

NGK Insulators, Ltd.: *See*—
Oda, Isao; and Soma, Takao, 4,908,256, Cl. 428-133.000.
Usami, Jun; and Sasaki, Yuichi, 4,908,575, Cl. 324-711.000.

NGK Spark Plug Co., Ltd.: *See*—
Akao, Shigeaki; Hayakawa, Masakatu; and Kawamura, Mitsuyoshi, 4,907,330, Cl. 123-90.510.

Nicholson, Robert D.; Kaake, Steven A. F.; and Smith, Robert F., to Glasstech, Inc. Template for installing photovoltaic panel assembly and method. 4,907,915, Cl. 405-229.000.

Nickolaus, Robert D., to Stewart Warner Corporation. Directional spring for AC synchronous motor. 4,908,806, Cl. 368-9.000.

Nicolay GmBH: *See*—
Muz, Edwin, 4,907,594, Cl. 128-633.000.

Niemeck, Graciela; and Borgerson, James. Thermo-roto mixer apparatus. 4,907,893, Cl. 366-144.000.

Nihei, Ryo: *See*—
Toyoda, Kenichi; Toril, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,907,467, Cl. 74-479.000.

Nihira, Hiroyuki; and Itoh, Nobuyuki, to Kabushiki Kaisha Toshiba. Method of manufacturing bipolar transistor. 4,908,324, Cl. 437-31.000.

Nii, Kenichi: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; and Torichigai, Masaaki, 4,907,542, Cl. 122-379.000.

Niimura, Isao; Nagasaka, Hideo; Takeuchi, Manabu; Nita, Toshiyuki; and Suzuka, Susumu, to Hodogaya Chemical Co., Ltd. Use of a resin powder composition for electrostatic coating. 4,908,225, Cl. 427-25.000.

Niino, Masahiko, to Yamada Electric Mfg. Co., Ltd. Motor protector. 4,908,595, Cl. 337-105.000.

Nike, Inc: *See*—
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Nike International Ltd.: *See*—
Allen, Thomas P.; and Eisenbach, Lawrence P., 4,907,355, Cl. 36-131.000.

Nikon Corporation: *See*—
Imamura, Kazunori, 4,908,517, Cl. 250-563.000.
Sato, Shigemasa; Katayama, Akira; and Terunuma, Hiroshi, 4,908,646, Cl. 354-402.000.
Suwa, Kyoichi; Hirukawa, Shigeru; and Tateno, Hiroki, 4,908,656, Cl. 355-53.000.
Yanagisawa, Masaaki, 4,908,639, Cl. 350-431.000.

Nilssen, Ole K. Trigger and control means for bridge inverter. 4,908,754, Cl. 363-37.000.

Nilsson, Sven E. L.: *See*—
Lilja, Jan E.; and Nilsson, Sven E. L., 4,907,606, Cl. 131-273.000.

Nimbus Medical, Inc.: *See*—
Moise, John C.; Wampler, Richard K.; and Butler, Kenneth C., 4,908,012, Cl. 600-16.000.

Ninomiya, Akira: *See*—
Ishikawa, Shigeo; Tokuda, Hiroshi; and Ninomiya, Akira, 4,908,632, Cl. 346-76.0PH.

Nippon Mining Co., Ltd.: *See*—
Taki, Kazuhiro; Mitsuyoshi, Yasuhiro; and Shiraki, Takeshi, 4,908,072, Cl. 148-11.50F.
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, 4,908,275, Cl. 428-457.000.

Nippon Oil Company, Ltd.: *See*—
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, 4,908,420, Cl. 526-76.000.

Nippon Oil and Fats, Co., Ltd.: *See*—
Amano, Tomoyuki; Kurokawa, Koichi; and Edamura, Koji, 4,908,080, Cl. 149-2.000.
Tasaki, Yoji; Tanaka, Akihiro; Kurokawa, Koichi; Hattori, Katsuhide; and Amano, Motoyuki, 4,908,079, Cl. 149-2.000.

Nippon Paint Co., Ltd.: *See*—
Muramoto, Hisaichi; Saito, Koichi; and Ishii, Keizou, 4,908,468, Cl. 560-14.000.
Yamasoe, Katsuyoshi, 4,908,075, Cl. 148-256.000.

Nippon Petrochemicals Company, Limited: *See*—
Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, 4,908,473, Cl. 560-104.000.

Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Natori, Katsushi, 4,908,717, Cl. 358-474.000.

Nippon Telegraph and Telephone Corporation: *See*—
Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, 4,908,862, Cl. 380-28.000.

Nippon Wiperblade Co., Ltd.: *See*—
Arai, Masaru; and Saita, Itsuro, 4,907,315, Cl. 15-250.190.

Nippon Zoki Pharmaceutical Co., Ltd.: *See*—
Yamamoto, Atsushi; Ienaga, Kazuharu; Higashiura, Kunihiko; and Kurohashi, Masaharu, 4,908,353, Cl. 514-19.000.

Nippondenso Co., Ltd.: *See*—
Saito, Toshitaka; Sano, Hiromi; Ota, Soji; and Udo, Syohei, 4,908,119, Cl. 204-426.000.
Sakai, Kazunori; Wakabayashi, Shinji; and Machata, Hiromi, 4,908,572, Cl. 324-173.000.

Nishida, Kozi: *See*—
Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; Anzai, Hisao; and Makino, Hideaki, 4,908,402, Cl. 524-495.000.

Nishida, Masanori; Aoyama, Masashige; and Onodera, Hiroshi, to Sanyo Electric Co., Ltd. Insulated gate field effect transistor with buried layer. 4,908,681, Cl. 357-23.300.

Nishida, Taizo: *See*—
Kuno, Michiaki; Akizuki, Noboru; and Nishida, Taizo, 4,908,786, Cl. 364-710.110.

Nishiguchi, Masanori, to Sumitomo Electric Industries, Ltd. Wiring structure of semiconductor pressure sensor. 4,908,693, Cl. 357-68.000.

Nishii, Junji; Inagawa, Ikuo; Yamagishi, Takashi; Morimoto, Shozo; and Iizuka, Ryuji, to Non Oxide Glass Research and Development Co., Ltd. Process for producing chalcogenide glass fiber. 4,908,053, Cl. 65-3.110.

Nishikawa, Toshio: *See*—
Tabata, Yutaka; Nishikawa, Toshio; and Sakai, Hiroshi, 4,907,370, Cl. 51-5.00D.

Nishimura, Nobuhiko; Masuyama, Fujimitsu; and Sada, Tetsuro, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of evaluating residual life of heat-resistant steel. 4,907,457, Cl. 73-787.000.

Nishimura, Tomohiro: *See*—
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,908,184, Cl. 420-534.000.

Nishimura, Yukinobu: *See*—
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,556, Cl. 123-486.000.
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,557, Cl. 123-488.000.

Nishioka, Toshio: *See*—
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 4,908,455, Cl. 548-268.400.

Nishiuchi, Kenichi; Akahira, Nobuo; Yamada, Noboru; and Ohno, Eiji, to Matsushita Electric Industrial Co., Ltd. Information recording medium. 4,908,835, Cl. 374-45.000.

Nissan Chemical Industries Ltd.: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.

Nissan Motor Company, Ltd.: *See*—
Etoh, Yoshiyuki, 4,908,764, Cl. 364-426.040.
Ishimaru, Wataru, 4,907,471, Cl. 74-745.000.

Nisshin Steel Co., Ltd.: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,908,106, Cl. 204-23.000.

Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.

Nita, Toshiyuki: *See*—
Niimura, Isao; Nagasaka, Hideo; Takeuchi, Manabu; Nita, Toshiyuki; and Suzuka, Susumu, 4,908,225, Cl. 427-25.000.

Nitto Denko Corporation: *See*—
Iimura, Mituo; Heguri, Masatoshi; Gunji, Satoru; and Ikehara, Kenji, 4,908,251, Cl. 428-68.000.

Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
Satoh, Yoshiaki; Nakashima, Yasutaka; Enomoto, Kanehiko; Fujiwara, Atsushi; and Doi, Toshiaki, 4,908,313, Cl. 435-129.000.

Nitto Kohki Co., Ltd.: *See*—
Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, 4,907,830, Cl. 285-91.000.

Niwa, Takashi: *See*—
Honda, Sueaki; Hayashi, Mitsuji; Kiyono, Yasuhiro; Niwa, Takashi; and Hayakawa, Tomohiko, 4,908,485, Cl. 200-462.000.

Noba, Kunihiro; Sakuraba, Yukio; and Urano, Katsuyoshi, to Tokai Rubber Industries, Ltd. Optical fiber connector and method for producing the same. 4,907,852, Cl. 350-96.200.

Noble, Lowell A. Three dimensional viewing glasses. 4,907,860, Cl. 350-334.000.

Nobles, Charles M.: *See*—
Wolfe, Paul T.; Nobles, Charles M.; and Miller, Lane R., 4,907,680, Cl. 188-299.000.

Nobuhiko, Sakai: *See*—
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.

Nogita, Shunsuke: *See*—
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.

Noguchi, Masaru: *See*—
Ishikawa, Hiromi; and Noguchi, Masaru, 4,908,511, Cl. 250-235.000.

Noguchi, Tsuneharu: *See*—
Kum, Kwang N., 4,907,579, Cl. 128-156.000.

Nohara, Makoto: *See*—
Taniguchi, Manabu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, 4,907,460, Cl. 73-862.330.

Nojima, Kazuo: *See*—
Takeda, Fuchio; Nojima, Kazuo; and Nakamura, Yasutaka, 4,908,665, Cl. 355-245.000.

Nolan, James A.: *See*—
Call, David B.; Nolan, James A.; and Lassman, Steven J., 4,907,449, Cl. 73-170.00R.

Noll, Frederick E.: *See*—
Jones, Kelly E.; and Noll, Frederick E., 4,908,054, Cl. 65-30.110.

Non Oxide Glass Research and Development Co., Ltd.: *See*—
Nishii, Junji; Inagawa, Ikuo; Yamagishi, Takashi; Morimoto, Shozo; and Iizuka, Ryuji, 4,908,053, Cl. 65-3.110.

Nonoyama, Makoto, to Kabushiki Kaisha Toshiba. Scanning apparatus with a mechanism to scan both sides of an original. 4,908,719, Cl. 358-494.000.

Noritsu Koki Co., Ltd.: *See*—
Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, 4,908,667, Cl. 355-256.000.

Noro, Masao: *See*—
Suzuki, Eiichi; Yokoyama, Kenji; and Noro, Masao, 4,908,752, Cl. 363-17.000.

Norsk Hydro A.S.: *See*—
Knagenhjelm, Hans O., 4,908,491, Cl. 219-61.000.

North American Philips Corporation: *See*—
Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., 4,908,697, Cl. 358-12.000.

North Carolina State University: *See*—
Shih, Jason C. H.; and Williams, C. Michael, 4,908,220, Cl. 426-61.000.

North, John M.: *See*—
Hooper, Alan; North, John M.; and Neat, Robin J., 4,908,284, Cl. 429-192.000.

Northern Telecom Limited: *See*—
Vea, Matthew J. J., 4,908,825, Cl. 370-110.300.

Northeved, Allan: *See*—
Jacobsen, Erik; Overland, Christian; Northeved, Allan; and Langkaer, Carsten, 4,908,011, Cl. 600-12.000.

Northwestern University: *See*—
Marhic, Michel E., 4,907,851, Cl. 350-96.190.

Norton Company: *See*—
Bouchard, William L.; Sudol, Charles W.; and Wing, Keith E., Sr., 4,907,376, Cl. 51-209.00R.

Nosaka, Kazuhiko: *See*—
Onayama, Shuichi; and Nosaka, Kazuhiko, 4,907,847, Cl. 350-3.730.

Nova-Werke AG: *See*—
Fuchs, Peter, 4,907,555, Cl. 123-446.000.

Nozawa, Masafumi: *See*—
Yamagata, Hirotsugu; Oka, Takafumi; Nozawa, Masafumi; and Kawada, Shinichi, 4,908,793, Cl. 365-52.000.

Nozawa, Minoru: *See*—
Saito, Atsushi; Koizumi, Yutaka; Mori, Toshihiro; and Nozawa, Minoru, 4,908,636, Cl. 346-140.00R.

Numata, Tatsuo: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.

NUS Corporation: *See*—
McLeod, N. Barrie, 4,908,515, Cl. 250-507.100.

Nygard, James C.: *See*—
Miles, Alden R.; Schwandt, Theodore F.; Nygard, James C.; Loder, Harry A.; and Emmel, John J., 4,907,825, Cl. 281-51.000.

Nytomt, Jan: *See*—
Johansson, Hans; and Nytomt, Jan, 4,907,562, Cl. 123-605.000.

Oak Industries, Inc.: *See*—
Cotic, Dennis J., 4,907,686, Cl. 193-45.000.

Obama, Masao; and Kikuchi, Masaaki, to Kabushiki Kaisha Toshiba. Torque sensor. 4,907,462, Cl. 73-862.360.

Oberweiler, Gunter; Spies, Johann W.; Wirthwein, Udo; and Weber, Friedhelm, to Vosslob-Werke GmbH. Device for attaching a rail to a bearing element. 4,907,740, Cl. 238-238.000.

O'Callaghan, Wilfrid B., to Alcan International Limited. Metal/air battery with recirculating electrolyte. 4,908,281, Cl. 429-27.000.

Ochiai, Yoshinori: *See*—
Nakajima, Yasuyuki; Makabe, Takahiro; Nakayama, Kazunari; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,908,379, Cl. 514-274.000.

C ta, Isao; and Soma, Takao, to NGK Insulators, Ltd. Ceramic-metal composite bodies. 4,908,256, Cl. 428-133.000.

Oerther, Bernhard: *See*—
Tschepke, Josef; Oerther, Bernhard; and Hintermaier, Eduard, 4,907,394, Cl. 53-412.000.

Oertle, Konrad: *See*—
Meyer, Willy; and Oertle, Konrad, 4,908,467, Cl. 560-12.000.

Oestreich, Ulrich, to Siemens Aktiengesellschaft. Marine cable for a fiber optic waveguide with regenerator supply. 4,907,855, Cl. 350-96.230.

Ogasawara, Shinji; Isomura, Yukio; and Tanimoto, Tetsurou, to Aisin Seiki Kabushiki Kaisha. Outside handle device for use in a vehicle. 4,907,833, Cl. 292-336.300.

Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Pattern forming method. 4,908,299, Cl. 430-323.000.

Ogawa, Yoshinari; Yamashiro, Seiichi; and Hironaka, Katsuhiko, to Teijin Limited. Resin compositions. 4,908,407, Cl. 525-113.000.

Ogura, Masahiko, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,908,664, Cl. 355-235.000.

O'Hagan, Michael A.: *See*—
Goldbach, Gary O.; and O'Hagan, Michael A., 4,908,124, Cl. 209-139.100.

Ohara, Akinori: *See*—
Yamada, Tadatoshi; Iwamoto, Masatami; Ohara, Akinori; Nakamura, Shirou; and Yamamoto, Yuuichi, 4,908,580, Cl. 328-235.000.

Ohara, Riichiro; Iwama, Satoshi; Ida, Eiji; and Isobe, Noriyuki, to Toyo Tire & Rubber Company Limited. Rubber composition for tire tread. 4,908,401, Cl. 524-495.000.

Ohashi, Kunio; and Nagata, Syoichi, to Sharp Kabushiki Kaisha. Photosensitive microcapsule recorder with transfer sheet transported at an angle relative to the axial direction of the pressure rollers. 4,908,633, Cl. 346-107.00R.

Ohashi, Masashi: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Ohba, Shinya: *See*—
Koike, Norio; Ozaki, Toshifumi; Nakai, Masaaki; Ando, Haruhisa; Ohba, Shinya; Ono, Hideyuki; Akimoto, Hajime; and Kinugasa, Hajime, 4,908,684, Cl. 357-24.000.

Ohga, Juro; Fujii, Kensaku; Masuda, Hiroyuki; and Sato, Yuka, to Fujitsu Limited. Electronic telephone terminal having noise suppression function. 4,908,855, Cl. 379-387.000.

Ohira, Tadashi; and Maruta, Syuzi, to Minolta Camera Kabushiki Kaisha. Image duplicating apparatus having composite and duplex modes of operation. 4,908,660, Cl. 355-206.000.

Ohl, William C.: *See*—
Cosmos, Pete; Mosser, Benjamin H., III; and Ohl, William C., 4,908,335, Cl. 439-79.000.

Ohneda, Noboru: *See*—
Ushioda, Shunta; Tsukuda, Ichizo; Ohneda, Noboru; and Sukimoto, Minobu, 4,907,735, Cl. 228-173.400.

Ohno, Eiji: *See*—
Nishiuchi, Kenichi; Akahira, Nobuo; Yamada, Noboru; and Ohno, Eiji, 4,908,835, Cl. 374-45.000.

Ohno, Matsuo, to Ohno, Matsuo; and Kabushiki Kaisha Asaplan. Stereo processing system. 4,908,858, Cl. 381-1.000.

Ohnuki, Ichiro: *See*—
Higashihara, Masaki; Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, 4,908,645, Cl. 354-402.000.

Ohsaka, Yohnosuke; and Takaki, Shoji, to Daikin Industries Ltd. Process for purification of 2,2,3,3-tetrafluorooxetane. 4,908,460, Cl. 549-511.000.

Ohshima, Kohichi: *See*—
Ide, Yukio; Ohshima, Kohichi; Fujimura, Itaru; and Kageyama, Yoshiyuki, 4,908,292, Cl. 430-128.000.

Ohshima, Yukiji: *See*—
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Ohta, Kenichi: *See*—
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Ohta, Masahiro: *See*—
Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,908,409, Cl. 528-188.000.
Ohta, Mutsumi: *See*—
Kaneko, Masahide; Koike, Atsushi; Ohta, Mutsumi; Matsuda, Kiichi; Mukawa, Naoki; and Kato, Yoichi, 4,908,862, Cl. 380-28.000.
Ohtaka, Michihiro: *See*—
Ueda, Shinichi; Ohtaka, Michihiro; Nakayama, Yoshiaki; Shinba, Hiroaki; and Ichikawa, Hiroshi, 4,907,836, Cl. 276-39.100.
Ohtani, Hichiro: *See*—
Inada, Masanori; Suetake, Naruki; Ohtani, Hichiro; and Yamakawa, Tomoya, 4,907,446, Cl. 73-118.200.
Ohtsuka, Nobuo, to Starloy Industrial Co., Ltd. Cobalt recovery method. 4,908,462, Cl. 556-147.000.
Ohyama, Masao; and Nagasawa, Tsuyoshi, to Sony Corporation. Compact recording and/or reproducing apparatus with oblique rotary head. 4,908,723, Cl. 360-85.000.
Ohzeki, Minoru: *See*—
Toyama, Takashi; Ohzeki, Minoru; and Yukawa, Takahiro, 4,908,547, Cl. 313-471.000.
Oie, Takayuki, to Pioneer Electronic Corporation. Method and apparatus for controlling a spindle servo using pickup position and shift information. 4,908,810, Cl. 369-50.000.
Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Polyimide. 4,908,409, Cl. 528-188.000.
Oishi, Tetsuo: *See*—
Karita, Mitsuji; Shinya, Tsutomu; and Oishi, Tetsuo, 4,908,533, Cl. 310-12.000.
Oja, Tonis: *See*—
Marlow, Bruce J.; Oja, Tonis; and Goetz, Philip J., 4,907,453, Cl. 73-584.000.
Ojima, Masahiro; Terao, Motoyasu; Taniguchi, Yoshio; Imazeki, Shuji; and Tomioka, Yasushi, to Hitachi, Ltd. Wavelength multiplexing optical recording apparatus. 4,908,813, Cl. 369-94.000.
Oka, Takafumi: *See*—
Yamagata, Hirotsugu; Oka, Takafumi; Nozawa, Masafumi; and Kawada, Shinichi, 4,908,793, Cl. 365-52.000.
Oka, Tetsuo: *See*—
Ozaki, Akio; Katsumata, Ryoichi; and Oka, Tetsuo, 4,908,312, Cl. 435-108.000.
Okada, Kazuo: *See*—
Tadokoro, Michihiro; and Okada, Kazuo, 4,908,809, Cl. 369-13.000.
Okamoto, Katsuo: *See*—
Otawa, Yasuhiko; Maeda, Toshiyuki; Hiraoka, Kunihide; and Okamoto, Katsuo, 4,908,412, Cl. 525-286.000.
Okamoto, Muneji: *See*—
Machida, Satoshi; Hasegawa, Shigekazu; Ota, Yoshimi; and Okamoto, Muneji, 4,907,465, Cl. 74-89.200.
Okamoto, Yukio; and Murayama, Seiichi, to Hitachi, Ltd. Microwave plasma production apparatus. 4,908,492, Cl. 219-121.520.
Okatani, Toshiyuki: *See*—
Matsuzawa, Minoru; Tsuchiya, Shigetada; and Okatani, Toshiyuki, 4,907,535, Cl. 119-14.550.
Okazaki, Masaaki; and Kadomura, Itsuro, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having partition member which includes a double-layered section. 4,907,786, Cl. 267-140.100.
Oki Electric Industry Co., Ltd.: *See*—
Fujisawa, Akihiko, 4,908,620, Cl. 341-108.000.
Shimokawa, Kimiaki; and Hoga, Hiroshi, 4,908,333, Cl. 437-195.000.
Oki, Tunehei: *See*—
Saeki, Takeaki; Ishikawa, Hideo; and Oki, Tunehei, 4,908,479, Cl. 564-277.000.
Okimoto, Tsuyoshi: *See*—
Kusaka, Kazuo; Suehiro, Shigeo; Tajiri, Noboru; Nakamura, Kiyoshi; and Okimoto, Tsuyoshi, 4,907,784, Cl. 266-235.000.
Okuda, Naoki: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.
Okumura, Minoru; Maekawa, Yoshio; Mizuno, Hironori; and Yagiyu, Osamu, to Taki Chemical Co., Ltd. 1-[2-(4-Hydroxybenzoyl)ethanoyl]-2-piperidone and a process for production as well as alcohol fermentation promoter containing the same as effective ingredient. 4,908,373, Cl. 514-327.000.
Okumura, Tsuyoshi, to Koyo Seiko Co., Ltd. Automobile wheel bearing unit. 4,907,445, Cl. 73-118.100.
Okuyama, Shingo: *See*—
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, 4,908,590, Cl. 333-183.000.
Olaf Kayser: *See*—
Snyder, Francis H., Jr., 4,907,502, Cl. 99-455.000.
Olin Corporation: *See*—
Ashok, Sankaranarayanan; and Melillo, Thomas J., 4,907,639, Cl. 164-46.000.
Grosso, Paul V.; Morgan, Michael J.; Wing, Feagin A., Jr.; and Burt, Williard F., 4,908,301, Cl. 430-45.000.
Simon, Mark A.; Knowles, Steve; and Smith, William, 4,907,407, Cl. 60-203.100.
Oliver, George R.; and Oliver, Stephen G. Cutting arrangement. 4,907,404, Cl. 56-256.000.
Oliver, Stephen G.: *See*—
Oliver, George R.; and Oliver, Stephen G., 4,907,404, Cl. 56-256.000.
Ollivier, Roland: *See*—
Buzas, Andre ; Merour, Jean-Yves; and Ollivier, Roland, 4,908,365, Cl. 514-252.000.
Olympic Manufacturing Group, Inc.: *See*—
Choiniere, Stanley W., 4,907,927, Cl. 411-368.000.
Olympus Optical Co., Ltd.: *See*—
Kanno, Toshiyuki; Watanabe, Hitoshi; and Hamanishi, Kohei, 4,908,294, Cl. 430-270.000.
Nagasaki, Tatsuo, 4,907,573, Cl. 128-24.00A.
Omori Machinery Co., Ltd.: *See*—
Omori, Shozo; and Sekiguchi, Takeshi, 4,907,393, Cl. 53-410.000.
Yamamoto, Masaru, 4,907,399, Cl. 53-450.000.
Omori, Shozo; and Sekiguchi, Takeshi, to Omori Machinery Co., Ltd.; and Mitsubishi Gas Chemical Company, Inc. Packaging method and apparatus. 4,907,393, Cl. 53-410.000.
Omron Tateisi Electronics Co.: *See*—
Honda, Sueaki; Hayashi, Mitsuji; Kiyono, Yasuhiro; Niwa, Takashi; and Hayakawa, Tomohiko, 4,908,485, Cl. 200-462.000.
Omura, Hideo: *See*—
Omura, Hitoshi; Yamada, Katsutada; and Omura, Hideo, 4,908,280, Cl. 428-679.000.
Omura, Hitoshi; Yamada, Katsutada; and Omura, Hideo, to Toyo Kohan Co., Ltd. Scratch and corrosion resistant, formable nickel plated steel sheet, and manufacturing method. 4,908,280, Cl. 428-679.000.
Onaga, Eimei M.: *See*—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Booth, Barrett L., 4,908,556, Cl. 318-568.200.
Onayama, Shuichi; and Nosaka, Kazuhiko, to NEC Home Electronics Ltd. Optical pickup and hologram therefor. 4,907,847, Cl. 350-3.730.
Onishi, Masayoshi; Umemaru, Hisato; and Ozawa, Hiromasa, to Mitsubishi Denki Kabushiki Kaisha. Steering torque detecting apparatus. 4,907,668, Cl. 180-142.000.
Ono, Hideyuki: *See*—
Koike, Norio; Ozaki, Toshifumi; Nakai, Masaaki; Ando, Haruhisa; Ohba, Shinya; Ono, Hideyuki; Akimoto, Hajime; and Kinugasa, Hajime, 4,908,684, Cl. 357-24.000.
Onodera, Hiroshi: *See*—
Nishida, Masanori; Aoyama, Masashige; and Onodera, Hiroshi, 4,908,681, Cl. 357-23.300.
Onodera, Tsutomu; and Yamada, Takeshi, to Fujikura Ltd. Method of examining the states of alignment of glass fibers of a pair of ribbon fiber cables. 4,908,677, Cl. 356-73.100.
Oohira, Jun: *See*—
Uda, Masashi; and Oohira, Jun, 4,908,089, Cl. 156-439.000.
Ooshima, Katsumi: *See*—
Hagiwara, Yoshihiko; and Ooshima, Katsumi, 4,907,468, Cl. 74-512.000.
Opie, Eric; Silverstein, Fred E.; and Terry, Elizabeth J., to Opielab, Inc. Packaging system for disposable endoscope sheaths. 4,907,395, Cl. 53-434.000.
Opielab, Inc.: *See*—
Opie, Eric; Silverstein, Fred E.; and Terry, Elizabeth J., 4,907,395, Cl. 53-434.000.
Opticord, Inc.: *See*—
Sandell, Patrick B.; and Ditzig, Albert, 4,908,817, Cl. 369-291.000.
Orion Machinery Co. Ltd.: *See*—
Matsuzawa, Minoru; Tsuchiya, Shigetada; and Okatani, Toshiyuki, 4,907,535, Cl. 119-14.550.
Orthner, Carolyn, to American National Red Cross. Protein C activator. 4,908,314, Cl. 435-219.000.
Ortica, Roberto: *See*—
Li Bassi, Giuseppe; and Ortica, Roberto, 4,908,398, Cl. 524-99.000.
Orwin, John M.: *See*—
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Osaka Diamond Industrial Co.: *See*—
Sowa, Nobuhiro; and Koroku, Syuichiro, 4,907,564, Cl. 125-21.000.
Osaka Yuki Kagaku Kogyo Kabushiki Kaisha: *See*—
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Porter, David L., to Ford Motor Company. Speed control cable attachment. 4,907,553, Cl. 123-400.000.

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DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.

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Caravajal, Gregory S.; and Hatfield, Gretchen R., 4,908,148, Cl. 252-135.000.

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Pu, Lyong S.: *See—*
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Quay, Marvin F.: *See—*
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Williams, Roger W., Jr., 4,907,737, Cl. 236-11.000.

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Davis, Terry W.; and Gates, James P., 4,907,506, Cl. 101-115.000.

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Ralph, Vernon C.: *See—*
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Raubenheimer, Hans-Juergen: *See—*
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Raychem Corporation: *See—*
Fang, Shou-Mean; and Camphouse, Charles H., 4,907,340, Cl. 29-610.100.
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Raytheon Company: *See—*
Tustison, Randal W.; and Montanari, Dennis G., 4,907,846, Cl. 350-1.600.

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Reed Tool Company: *See*—
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Refior, Lawrence M.: *See*—
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Regie Nationale des Usines Renault: *See*—
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Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.
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Reichman, Joseph, to Grumman Aerospace Corporation. Spatial light modulator using surface state photodiodes. 4,908,584, Cl. 330-4.300.
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Remick, Robert J.: *See*—
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Reuter, Alfred, to Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG. Process and apparatus for the feeding of tree trunks to a processing machine. 4,907,632, Cl. 144-356.000.
Reynolds, Evan B. Apparatus and method for removing cat hair. 4,907,540, Cl. 119-86.000.
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Reynolds, Rodger L.: *See*—
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Rhoades, Mark K.: *See*—
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Rhone-Poulenc Sante: *See*—
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Ribbon Technology Corporation: *See*—
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Ide, Yukio; Ohshima, Kohichi; Fujimura, Itaru; and Kageyama, Yoshiyuki, 4,908,292, Cl. 430-128.000.
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Sakano, Yukio, 4,908,716, Cl. 358-453.000.
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Suzuki, Minoru, 4,908,675, Cl. 355-326.000.
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Watanabe, Yoichiro; Aoki, Mitsuo; Isoda, Tetsuo; Nakayama, Nobuhiro; Sasaki, Fumihiro; and Kakigawa, Karumi, 4,908,290, Cl. 430-106.600.
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Rinderer, Eric R., to B-Line Systems, Inc. Pipe positioning and support system. 4,907,766, Cl. 248-57.000.
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Rivier, Jean E. F.: *See*—
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Robert Abraham Limited: *See*—
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Robeson, Lloyd M.; Winslow, Paul A.; Matzner, Markus; Harris, James E.; and Maresca, Louis M., to Amoco Corporation. Chain-extended poly(aryl ether ketones). 4,908,425, Cl. 528-125.000.
Robinson, Jeffery H.; and Dodd, Ian, to Beecham Group p.l.c. Reversibly blocked plasmin, t-PA hybrid fibrinolytic enzymes and pharmaceutical compositions and anti-thrombotic use thereof. 4,908,204, Cl. 424-94.200.
Robinson Nugent, Inc.: *See*—
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Rockwell, Martin V. Combined accessory carrier and service stand for a chainsaw. 4,907,778, Cl. 248-676.000.
Roden, Thomas V. Agricultural mower having means for raising the reel to a clearing height when the cutter bar engages an obstacle. 4,907,400, Cl. 56-10.400.

Rodland, Karin D.; and Russell, Peter J., to Rodland, Karin D. Hybridization method and probe for detecting nucleic acid sequences. 4,908,307, Cl. 435-6.000.
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Rodriguez, Alan; Rose, John A.; Waller, Clifford B.; and Doyle, Anthony W., to Angus Fire Armour Limited; and Thames Water Authority. Pipeline renovation system. 4,907,911, Cl. 405-154.000.
Roeker, David C.; and Ott, Ronald L., to Minnesota Mining and Manufacturing Company. Self centering buffing pad with low temperature tuft bonding adhesive. 4,907,313, Cl. 15-98.000.
Roel-Rodriguez, Santiago. Ski simulator. 4,907,796, Cl. 272-97.000.
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Rose, Eric P., to Guardian Products, Inc. Foldable rolling walker. 4,907,794, Cl. 272-70.300.
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Rose, Floyd D.; Moore, Steven M.; and Knotts, Richard W. Musical instrument sustainers and transducers. 4,907,483, Cl. 84-726.000.
Rose, John A.: *See*—
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Ross, Michael R. Suspension prosthetic sleeve for rigorous activity. 4,908,037, Cl. 623-32.000.
Ross, Sidney D.; Maher, Galeb H.; and Hutchins, Clinton E., to Sprague Electric Company. Dried emulsion ceramic process. 4,908,338, Cl. 501-1.000.
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Roth, Martin; and Monnier, Charles E., to Ciba-Geigy Corporation. Advanced epoxide resins based on cyclohex-1-ylmethylenediphenol derivatives or bicyclo[2.2.1]hept-1-ylmethylenediphenol derivatives. 4,908,423, Cl. 528-97.000.
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Rub, Bernardo, to Digital Equipment Corporation. Improved decoder. 4,908,721, Cl. 360-40.000.
Rub, Bernardo: *See*—
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Rubin, David. Method of making triple bonded unsaturated fatty acids. 4,908,162, Cl. 260-405.500.
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Rudenko, Georgy M.: *See*—
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Rushforth, Craig K.; Xie, Zhenhua; and Short, Robert T., to Unisys Corporation. Method and apparatus for decoding multiple bit sequences that are transmitted simultaneously in a single channel. 4,908,836, Cl. 375-1.000.
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Ryan, Kelly P. Removable tooth cap for use on the rotor of an agricultural feed bagger. 4,907,503, Cl. 100-65.000.
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S & C Co., Ltd.: *See*—
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S.I.P.A.P. Sas Di Demichelis Margherita & C.: *See*—
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S & K Products, Inc. A Division of Armstrong International: *See*—
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Saab-Scania Aktiebolag: *See*—
Johansson, Hans; and Nytomt, Jan, 4,907,562, Cl. 123-605.000.
Saarinen, Risto U., to Outokumpu Oy. Method and apparatus for reducing dust accretions while treating gases in a smelting furnace. 4,908,058, Cl. 75-25.000.
Sabet-Peyman, Farhang, to Litton Systems, Inc. Acoustic transducer. 4,908,543, Cl. 310-334.000.
Saby, Gerard; and Lemercier, Frederic. Modular constructional element in particular of a ladder or scaffolding. 4,907,675, Cl. 182-178.000.
Sada, Tetsuro: *See*—
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SAES Getters S.p.A.: *See*—
Barosi, Aldo; and Boffito, Claudio, 4,907,948, Cl. 417-53.000.
Saget, Pierre, to Societe Francaise d'Etudes d'Installations Siderurgiques. Point of junction of tubular metallic structures, notably for derrick platforms. 4,907,913, Cl. 405-211.000.
Sago, Akira; Ueda, Masashi; Takagi, Osamu; Matsumoto, Yumio; and Hayakawa, Kiyoharu, to Brother Kogyo Kabushiki Kaisha. Exposure system for image recording apparatus. 4,908,653, Cl. 355-27.000.
Sago, Akira: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Takagi, Osamu, 4,908,652, Cl. 335-27.000.
Saita, Itsuro: *See*—
Arai, Masaru; and Saita, Itsuro, 4,907,315, Cl. 15-250.190.
Saito, Atsushi; Koizumi, Yutaka; Mori, Toshihiro; and Nozawa, Minoru, to Canon Kabushiki Kaisha. Recovery device having a protruding portion providing reduced pressure for improved recovery and method using same. 4,908,636, Cl. 346-140.00R.
Saito, Hiroshi: *See*—
Tamada, Kazukiyo; Takatori, Naoki; Yokoyama, Tsuneo; Mikajiri, Satoshi; Kubota, Mineo; and Saito, Hiroshi, 4,908,643, Cl. 354-400.000.
Saito, Koichi: *See*—
Muramoto, Hisaichi; Saito, Koichi; and Ishii, Keizou, 4,908,468, Cl. 560-14.000.
Saito, Masanori: *See*—
Arai, Masakazu; Endo, Hiroshi; Gotoh, Toshihiro; Yagi, Toshio; Tanaka, Masanori; Saito, Masanori; and Mathuno, Shigeki, 4,908,393, Cl. 521-60.000.
Saito, Susumu: *See*—
Arimoto, Akira; Saito, Susumu; Tsuji, Yasuyuki; Namikawa, Osamu; and Mochizuki, Takeshi, 4,908,634, Cl. 346-108.000.
Saito, Toshitaka; Sano, Hiromi; Ota, Soji; and Udo, Syohei, to Nippondenso Co., Ltd. Apparatus for determining oxygen concentration. 4,908,119, Cl. 204-426.000.
Sakagami, Seigou: *See*—
Yamashita, Yukinori; Iwata, Kouichi; and Sakagami, Seigou, 4,907,677, Cl. 188-73.100.
Sakai, Hiroshi: *See*—
Tabata, Yutaka; Nishikawa, Toshio; and Sakai, Hiroshi, 4,907,370, Cl. 51-5.00D.
Sakai, Kazunari: *See*—
Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, 4,907,956, Cl. 425-110.000.
Sakai, Kazunori; Wakabayashi, Shinji; and Maehata, Hiromi, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Rotational speed sensor with unfixed and/or fixed edge speed calculation modes. 4,908,572, Cl. 324-173.000.
Sakakura, Toshiyasu: *See*—
Tanaka, Masato; and Sakakura, Toshiyasu, 4,908,451, Cl. 546-267.000.
Sakamaki, Takeshi, to Kabushiki Kaisha Toshiba. Automated chemical analyzer. 4,908,186, Cl. 422-64.000.
Sakamoto, Daiji: *See*—
Mizohata, Tadashi; and Sakamoto, Daiji, 4,908,548, Cl. 313-497.000.
Sakamoto, Keiji: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Iwamoto, Takashi, 4,908,559, Cl. 318-568.220.
Sakamoto, Koji: *See*—
Iwata, Nobuo; Sakamoto, Koji; and Tanzawa, Misao, 4,908,661, Cl. 355-211.000.
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, to Murata Manufacturing Co., Ltd. Chip-like LC filter. 4,908,590, Cl. 333-183.000.
Sakano, Yukio, to Ricoh Company, Ltd. Image processing apparatus. 4,908,716, Cl. 358-453.000.
Sakito, Yoji: *See*—
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 4,908,455, Cl. 548-268.400.

Sakono, Takashi; Inoue, Yasushi; and Nakatani, Shigeki, to Mazda Motor Corporation. V-type engine. 4,907,551, Cl. 123-196.00R.

Sakuraba, Yukio: *See—*
Noba, Kunihiro; Sakuraba, Yukio; and Urano, Katsuyoshi, 4,907,852, Cl. 350-96.200.

Sakurai, Nobuo: *See—*
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,908,271, Cl. 428-402.220.

Salesky, William J.: *See—*
Kar, Naresh J.; Salesky, William J.; and Guzowski, Steven J., 4,907,665, Cl. 175-410.000.

Salk Institute for Biological Studies, The: *See—*
Lederis, Karl P.; McMaster, Denis; and Rivier, Jean E. F., 4,908,352, Cl. 514-12.000.

Salomon S.A.: *See—*
Benoit, Louis; and Nerrinck, Bernard, 4,907,354, Cl. 36-119.000.
Dunand, Josiane; Arnulf, Paul; and Gasquet, Denis, 4,907,816, Cl. 280-615.000.
Schwarz, Gunter, 4,907,817, Cl. 280-615.000.

Salters, Charles. Portable arm rest apparatus. 4,907,835, Cl. 296-1.100.

Salyer, Ival O., to University of Dayton. Method for preparing polyolefin composites containing a phase change material. 4,908,166, Cl. 264-22.000.

Sam Outillage S.A.: *See—*
Bourrat, Andre, 4,907,756, Cl. 242-107.300.

Samsung Electronics Co., Ltd.: *See—*
Park, Hwa S., 4,908,488, Cl. 219-10.55R.

Sanchez, J. Michael; Strom, E. Thomas; Shu, Paul; and Alameddine, Bassem R., to Mobil Oil Corporation. Method for preventing steam channelling into a non-aquifer bottom water zone. 4,907,656, Cl. 166-270.000.

Sandell, Patrick B.; and Ditzig, Albert, to Opticord, Inc. Cartridge for optical data discs. 4,908,817, Cl. 369-291.000.

Sanders, Ira, to Mount Sinai School of Medicine of the City of New York, The. Device for controlling the glottic opening. 4,907,602, Cl. 128-787.000.

Sanders, Michael J. Method of operating a computer for rank ordering and weighting category alternatives. 4,908,758, Cl. 364-300.000.

Sanders, Robert N.: *See—*
Laurent, Sebastian M.; and Sanders, Robert N., 4,908,218, Cl. 426-2.000.

Sanken Sangyo Kabushiki Kaisha: *See—*
Kusaka, Kazuo; Suehiro, Shigeo; Tajiri, Noboru; Nakamura, Kiyoshi; and Okimoto, Tsuyoshi, 4,907,784, Cl. 266-235.000.

Sankey, John P.; and Johnson, Robert, to Interox Chemicals Limited. Preparation of esters. 4,908,474, Cl. 560-109.000.

Sankyo Kasei Co., Ltd.: *See—*
Maeda, Kannosuke; and Aoyama, Toshio, 4,908,043, Cl. 23-302.00T.

Sankyo Kasei Kabushiki Kaisha: *See—*
Yumoto, Tetsuo, 4,908,259, Cl. 428-209.000.

Sano, Hiromi: *See—*
Saito, Toshitaka; Sano, Hiromi; Ota, Soji; and Udo, Syohei, 4,908,119, Cl. 204-426.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Takeuchi, Toshio, 4,908,766, Cl. 364-448.000.

Santos, James P. Monitoring, ranging and locating devices. 4,908,627, Cl. 342-125.000.

Santrade Limited: *See—*
Anderrson, Erik T.; Wilson, Sten A.; and Schemel, John H., 4,908,071, Cl. 148-11.50F.

Sanyo Electric Co., Ltd.: *See—*
Nishida, Masanori; Aoyama, Masashige; and Onodera, Hiroshi, 4,908,681, Cl. 357-23.300.

Saotome, Shigeru; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Radiation image recording, read-out and reproducing apparatus. 4,908,520, Cl. 250-327.200.

Sapp, Steven P.: *See—*
Hu, Chenming; and Sapp, Steven P., 4,908,328, Cl. 437-63.000.

Sarnoff, Norton; Fletcher, Carl; and Chmela, John, to Ensar Corporation. Egg poacher for microwave oven. 4,908,487, Cl. 219-10.55E.

Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, to Nitto Kohki Co., Ltd. Fluid coupling. 4,907,830, Cl. 285-91.000.

Sasaki, Fumihiro: *See—*
Watanabe, Yoichiro; Aoki, Mitsuo; Isoda, Tetsuo; Nakayama, Nobuhiro; Sasaki, Fumihiro; and Kakigawa, Karumi, 4,908,290, Cl. 430-106.600.

Sasaki, Ikuo: *See—*
Nakagawa, Osamu; Yanagitani, Koji; Sasaki, Ikuo; and Banjo, Toshinobu, 4,908,178, Cl. 264-272.170.

Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; Anzai, Hisao; and Makino, Hideaki, to Mitsubishi Rayon Co., Ltd. Reinforced resin composition. 4,908,402, Cl. 524-495.000.

Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, to Nippon Oil Company, Ltd. Method for preparing resin having light color. 4,908,420, Cl. 526-76.000.

Sasaki, Nobukazu: *See—*
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.

Sasaki, Takashi; Taniguchi, Hajime; and Kainuma, Keiji, to Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries. Process for enzymatic preparation of cellooligosaccharides. 4,908,311, Cl. 435-101.000.

Sasaki, Takeshi; and Morita, Kiyoharu, to Daidotokushuko Kabushikikaisha. Sizing mill and method of rolling a round bar material. 4,907,438, Cl. 72-235.000.

Sasaki, Yuichi: *See—*
Usami, Jun; and Sasaki, Yuichi, 4,908,575, Cl. 324-711.000.

Sase, Akira: *See—*
Hara, Yasuhiko; Doi, Hideaki; Karasaki, Koichi; and Sase, Akira, 4,908,871, Cl. 382-8.000.

Sata, Takeo: *See—*
Iijima, Kenzaburou; and Sata, Takeo, 4,908,076, Cl. 148-302.000.

Satawa, Timothy: *See—*
Panecki, Frank; Satawa, Timothy; and Brank, Leon, 4,908,489, Cl. 219-10.770.

Sato, Isao: *See—*
Kirikami, Seiichi; Sato, Isao; Hirose, Fumiyuki; Arai, Osamu; and Iizuka, Nobuyuki, 4,907,406, Cl. 60-39.182.

Sato, Shigemasa; Katayama, Akira; and Terunuma, Hiroshi, to Nikon Corporation. Range measuring device for camera. 4,908,646, Cl. 354-402.000.

Sato, Susumu; Hashimoto, Osamu; Irie, Toshio; and Matsuno, Nobuo, to Kawasaki Steel Corporation. Method of producing a cold rolled steel sheet having a good ageing resistance and small anisotropy and adapted for deep drawing. 4,908,073, Cl. 148-12.00C.

Sato, Tsunehiko: *See—*
Shibata, Norio; Takeda, Hideo; and Sato, Tsunehiko, 4,907,530, Cl. 118-410.000.

Sato, Yoshimi: *See—*
Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, 4,908,065, Cl. 106-287.240.

Sato, Yuka: *See—*
Ohga, Juro; Fujii, Kensaku; Masuda, Hiroyuki; and Sato, Yuka, 4,908,855, Cl. 379-387.000.

Satoh, Ryohei: *See—*
Ishihara, Shousaku; Yokono, Hitoshi; Fujita, Tsuyoshi; Satoh, Ryohei; and Wasai, Kiyotaka, 4,908,696, Cl. 357-81.000.

Satoh, Yoshiaki; Nakashima, Yasutaka; Enomoto, Kanehiko; Fujiwara, Atsushi; and Doi, Toshiaki, to Nitto Kagaku Kogyo Kabushiki Kaisha, a part interest. Process for producing amides by use of microoganisms. 4,908,313, Cl. 435-129.000.

Satterthwaite, H. Sherwood. Ambulatory lumbar traction device. 4,907,575, Cl. 128-75.000.

Sauvion, Guy-Nool; and Caillod, Jack, to Pro-Catalyse. $CO+H_2O$ catalytic conversions. 4,908,199, Cl. 423-437.000.

Sawabe, Kosaku; and Hongoh, Takashi, to Ricoh Company, Ltd. Distance measuring device for automatic focusing camera. 4,908,648, Cl. 354-403.000.

Sayed, Aziz E.: *See—*
Zecher, Wilfried; Arlt, Dieter; and Sayed, Aziz E., 4,908,429, Cl. 528-353.000.

Sbordonne, Arturo, to Videocolor. Device for holding a substantially parallelepiped shaped part in position. 4,907,999, Cl. 445-66.000.

Scarsella, Edward L.: *See—*
Spotholz, Clifford H.; and Scarsella, Edward L., 4,907,719, Cl. 222-1.000.

Schachar, Ronald A. Method for improving farsightedness. 4,907,585, Cl. 606-28.000.

Schade, Horst: *See—*
Wanner, Dieter; and Schade, Horst, 4,908,195, Cl. 423-239.000.

Schafer, Rolf; and Hitz, Hans, to Amics AG. Extracts of embryonic organs, process for their preparation and pharmaceutical preparation containing them. 4,908,206, Cl. 424-95.000.

Schaffer, Ronald R.: *See—*
Egner, Walter A.; Schaffer, Ronald R.; Stauffer, Larry R.; and Warner, Gary N., 4,907,335, Cl. 29-283.500.

Schaffner, Paul: *See—*
Specker, Hugo; and Schaffner, Paul, 4,908,269, Cl. 428-369.000.

Schallner, Otto: *See—*
Jensen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, 4,908,377, Cl. 514-404.000.

Scharf, Bennett J.: *See—*
Howson, David C.; Fellinger, Michael W.; Popken, John A.; Altobellis, Richard M.; Scharf, Bennett J.; and Osbetski, Walter E., 4,908,017, Cl. 604-67.000.

Schaudt Maschinenbau GmbH: *See—*
Brill, Jurgen, 4,907,374, Cl. 51-168.000.

Schechter, Paul J.; Orwin, John M.; and Hinze, Christian K., to Merrell Dow Pharmaceuticals Inc. Use of 1,4-disubstituted-piperidinyl compounds in the manufacture of a medicament for the treatment of insomnia. 4,908,369, Cl. 514-277.000.

Schefczik, Ernst: *See—*
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 4,908,041, Cl. 8-638.000.

Scheib, Thomas J.: *See—*
Lane, John D.; Matsko, Theodore N.; Patella, Joseph G.; and Scheib, Thomas J., 4,908,747, Cl. 364-162.000.

Scheibli, Peter, to Ciba-Geigy Corporation. Fibre-reactive azo dyes containing vinylsulfonyl groups and further aliphatic fibre-reactive radicals. 4,908,436, Cl. 534-637.000.

Schemel, John H.: *See—*
Anderrson, Erik T.; Wilson, Sten A.; and Schemel, John H., 4,908,071, Cl. 148-11.50F.

Schenck Pegasus Corporation: *See—*
Meyer, Endre A.; and Kachman, Robert D., 4,907,615, Cl. 137-1.000.

Schering Corporation: *See*—
Govil, Sharad K.; and Kohlman, Paul, 4,908,213, Cl. 424-447.000.
Schilling, Michael: *See*—
Brachtl, Bruno O.; Coppersmith, Don; Hyden, Myrna M.; Matyas, Stephen M., Jr.; Meyer, Carl H. W.; Oseas, Jonathan; Pilpel, Shaiy; and Schilling, Michael, 4,908,861, Cl. 380-25.000.
Schirmer, K. E.; and Reis, Werner, to G. Rodenstock Instrumente GmbH. Contact lens for enabling treatment of the eye by laser. 4,907,872, Cl. 351-160.00R.
Schisler, Brian W.: *See*—
Gomes, Peter F.; Schisler, Brian W.; and Mooneyham, Gary L., 4,907,695, Cl. 206-386.000.
Schjoneman, Clifford M.: *See*—
Baker, Thomas M.; Dunn, Michael T.; Duven, Jeffrey E.; Hackler, Jim W.; Louden, Peter J.; and Schjoneman, Clifford M., 4,908,618, Cl. 340-945.000.
Schlageter, Markus: *See*—
Guerrato, Alfredo; Karpf, Martin; Berger, Hanny K.; Kompis, Ivan; and Schlageter, Markus, 4,908,470, Cl. 560-46.000.
Schleyerbach, Rudolf: *See*—
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,908,364, Cl. 514-243.000.
Schlich, William R.: *See*—
Holub, Fred F.; and Schlich, William R., 4,908,419, Cl. 525-425.000.
Schlosser, Charles E.: *See*—
Kohl, Vance L.; and Schlosser, Charles E., 4,907,422, Cl. 62-352.000.
Schlumberger Electronics (UK) Limited: *See*—
Vaughan, John E.; and Patry, Bernard, 4,908,769, Cl. 364-464.040.
Schlumberger Industries: *See*—
Guion, Christian, 4,908,499, Cl. 235-380.000.
Schlumberger Technology Corporation: *See*—
Hromas, Joe C., 4,907,655, Cl. 166-321.000.
Schmaier, Alvin H.: *See*—
Colman, Robert W.; and Schmaier, Alvin H., 4,908,431, Cl. 530-387.000.
Schmelzer, Michael A.: *See*—
Fredricks, Richard E.; and Schmelzer, Michael A., 4,908,246, Cl. 428-34.100.
Schmertz, John C.: *See*—
Palusamy, Sam S.; Schmertz, John C.; Li, Dali; Chirigos, John N.; Bond, Charles B.; and Yang, Chuang Y., 4,908,775, Cl. 364-508.000.
Schmid, Helmut: *See*—
Dullings, Josef; Kloker, Werner; Freitag, Dieter; Lusgen, Holger; Schmid, Helmut; and Winchenbach, Helmut, 4,908,216, Cl. 425-3.000.
Schmid, Walter; and Schwab, Bernhard, to Schmid, Walter. Blood pressure measuring appliance. 4,907,596, Cl. 128-672.000.
Schmidt, Gregory W.: *See*—
DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.
Schmidt, James E. Outboard storage rack for boats. 4,907,525, Cl. 114-364.000.
Schmidt, William A.: *See*—
DeForest, Sherman E.; Benyamin, Saied; Hier, Richard G.; Kruger, Robert A.; Power, Robert L.; Schmidt, Gregory W.; and Schmidt, William A., 4,908,876, Cl. 382-54.000.
Schneider GmbH & Co.: *See*—
Pfeil, Dieter, 4,907,942, Cl. 414-798.000.
Schoenwald, Siegfried, to Siemens Aktiengesellschaft. Side-channel compressor. 4,907,945, Cl. 415-117.000.
Schoepe, Adolf; and Dufau, Oscar R., to Fluidmaster Inc. In-field installable closing delay cup. 4,907,302, Cl. 4-382.000.
Schoeps, Jochen: *See*—
Leitz, Edgar; Eichenauer, Herbert; Ott, Karl-Heinz; Eckel, Thomas; Peters, Horst; and Schoeps, Jochen, 4,908,422, Cl. 527-67.000.
Scholl, Stephen R.; and Valentine, Michael D., to Valentine Research, Inc. Acceleration measuring system. 4,908,767, Cl. 364-453.000.
Schoofs, Franciscus A. C. M.: *See*—
Ludikhuize, Adrianus W.; van Mil, Job F. P.; and Schoofs, Franciscus A. C. M., 4,908,551, Cl. 315-209.00R.
Schottlfer, Franz: *See*—
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Schrader, Lutz: *See*—
Zecher, Wilfried; Arlt, Dieter; Schrader, Lutz; and Waldenrath, Werner, 4,908,430, Cl. 528-353.000.
Schreiber, Alan D., to University of Pennsylvania, Trustees of The. Inhibition of immune clearance using progesterone analogues. 4,908,358, Cl. 514-177.000.
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Antibacterial 8-cyano-1-cyclopropyl-1,4-dihydro-4-oxo-3-quinolinecarboxylic acids. 4,908,366, Cl. 514-252.000.
Schulz, Hans-Ulrich, to Cassella Aktiengesellschaft. Use of 2-oxo-1-pyrrolidineacetamide for the determination of the glomerular filtration rate in humans. 4,908,202, Cl. 424-9.000.
Schulze, Eckehart. System for monitoring the position of a machine component. 4,907,435, Cl. 72-21.000.
Schumacher, Percy W.: *See*—
Deane, John D.; and Schumacher, Percy W., 4,907,662, Cl. 175-329.000.
Schwab, Bernhard: *See*—
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Schwam, Paul A. Geodesic dome panel assembly and method. 4,907,382, Cl. 52-81.000.
Schwandt, Theodore F.: *See*—
Miles, Alden R.; Schwandt, Theodore F.; Nygard, James C.; Loder, Harry A.; and Emmel, John J., 4,907,825, Cl. 281-51.000.
Schwarz, Christoph; and Polzer, Herwig W., to Hohe KG. Tiltable outside rearview mirror for a vehicle. 4,907,869, Cl. 350-604.000.
Schwarz, Gunter, to Salomon S.A. Binding for cross-country ski. 4,907,817, Cl. 280-615.000.
Schwerdt, Hans-Werner, to Carl Freudenberg, Firma. Rubber cartridge spring. 4,907,787, Cl. 267-140.100.
Schwertfeger, Gunther: *See*—
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Schwertfeger, Werner: *See*—
Dapperheld, Steffen; Schwertfeger, Werner; and Wildt, Manfred, 4,908,107, Cl. 204-59.00F.
Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred. Process for preparation of dense molded bodies of polycrystalline aluminum nitride without use of sintering aids. 4,908,173, Cl. 264-63.000.
Scopas Technology Company, Inc., The: *See*—
Jefferis, Raymond P., III; Engler, Phillip V.; and Rosenblatt, Aaron A., 4,908,188, Cl. 422-111.000.
Scopes, Robert K.: *See*—
Holmquist, Barton; and Scopes, Robert K., 4,908,187, Cl. 422-81.000.
Scott, Graham A.: *See*—
Castonguay, Roger N.; Palmieri, Joseph M.; and Scott, Graham A., 4,907,342, Cl. 29-622.000.
Scott Paper Company: *See*—
Box, Larry, 4,908,097, Cl. 162-9.000.
Scott, Wayne. Shoe tree. 4,907,311, Cl. 12-120.500.
Sealey, Francis; and Weiland, Richard H., to Boeing Company, The. Contracting landing gear shock strut. 4,907,760, Cl. 244-100.00R.
Seberger, Oswald P. Device for silencing firearms and cannon. 4,907,488, Cl. 89-14.400.
Sedgley, Douglas W.: *See*—
Clarkson, Ian; Abel, Bruce; and Sedgley, Douglas W., 4,907,413, Cl. 62-55.500.
Seelbach, Elizabeth A.: *See*—
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Seidel, Dietrich; Wieland, Heinrich; Rosskopf, Gerhard; and Feller, Wolfgang, to B. Braun-SSG AG. Process for the selective extracorporeal precipitation of low-density lipoproteins. 4,908,354, Cl. 514-21.000.
Seifert, Horst H., to Prater Industries, Inc. Hammermill. 4,907,750, Cl. 241-73.000.
Seiko Epson Corporation: *See*—
Wakai, Yoichi; and Baba, Hiroyuki, 4,908,710, Cl. 358-236.000.
Seiscor Technologies, Inc.: *See*—
Casady, Donald R.; and Teodorescu, Ioan V., 4,908,819, Cl. 370-15.000.
Seitz, Friedrich: *See*—
Aldag, Reinhard; Neumann, Peter; Boetticher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, 4,908,448, Cl. 544-289.000.
Sekiguchi, Takeshi: *See*—
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Self, Fred. Rivet pin. 4,907,925, Cl. 411-339.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,908,678, Cl. 357-4.000.
Senn, Patrice: *See*—
Tawfik, Mohamed S.; and Senn, Patrice, 4,908,579, Cl. 328-167.000.
Senturia, Stephen D., to Massachusetts Institute of Technology. Traction and reaction force microsensor. 4,908,509, Cl. 356-373.000.
Service Tool Die & Mfg. Company: *See*—
Kossmann, Hans; and Herdzina, Frank J., 4,908,153, Cl. 204-300.0EC.
Setzer, Herbert: *See*—
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SGS-Thomson Microelectronics S.r.l.: *See*—
Poletto, Vanni, 4,908,856, Cl. 379-413.000.
Shaffer, John W.; Caleshu, Peter V.; and Johnston, David W., to GTE Products Corporation. Lead-in wire for compact fluorescent lamps. 4,908,546, Cl. 313-331.000.
Shah, Burt; and Shah, Sam, to Shah, Burt. Self retaining injection molded shims. 4,908,245, Cl. 428-33.000.
Shah, Hasmukh; Zielke, Henry; Patterson, Richard L.; and Pellegrino, Thomas P., to Molex Incorporated. Connector termination apparatus and method. 4,907,324, Cl. 29-33.00M.
Shah, Sam: *See*—
Shah, Burt; and Shah, Sam, 4,908,245, Cl. 428-33.000.
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Kuno, Michiaki; Akizuki, Noboru; and Nishida, Taizo, 4,908,786, Cl. 364-710.110.
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Ohashi, Kunio; and Nagata, Syoichi, 4,908,633, Cl. 346-107.00R.
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Shaw, Jane M.: *See*—
McBride, Donald G.; and Shaw, Jane M., 4,908,689, Cl. 357-67.000.
Shell Offshore, Inc.: *See*—
Cox, Bobby E., 4,907,657, Cl. 175-9.000.
Shell Oil Company: *See*—
Dewhirst, Kenneth C.; and Stewart, Thomas G., Jr., 4,908,424, Cl. 528-97.000.
Wang, Pen C., 4,908,458, Cl. 548-328.000.
Shepherd, Edward T.: *See*—
Chase, Elaine; Clitheroe, Adrian M.; Shepherd, Edward T.; and Beanlands, Peter, 4,908,550, Cl. 315-8.000.
Sherwin-Williams Company, The: *See*—
Miller, Joseph E., 4,908,230, Cl. 427-54.100.
Shiba, Yasuo: *See*—
Eto, Kunihiko; Takeuchi, Shirou; and Shiba, Yasuo, 4,907,461, Cl. 73-862.330.
Shibano, Yoshihide, to S & C Co., Ltd. Ultrasonic washing apparatus. 4,907,611, Cl. 134-60.000.
Shibasaki, Ichiro; and Kajino, Takashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Magnetoelectric transducer. 4,908,685, Cl. 357-27.000.
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Shibata, Norio; Takeda, Hideo; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Apparatus for applying a liquid to a support. 4,907,530, Cl. 118-410.000.
Shibue, Toshiaki: *See*—
Nakamura, Shinichi; and Shibue, Toshiaki, 4,908,304, Cl. 430-615.000.
Shida, Masami: *See*—
Manaka, Toshio; and Shida, Masami, 4,907,558, Cl. 123-489.000.
Shigeta, Sadaaki: *See*—
Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, 4,907,956, Cl. 425-110.000.
Shih, Jason C. H.; and Williams, C. Michael, to North Carolina State University. Feather-lysate, a hydrolyzed feather feed ingredient and animal feeds containing the same. 4,908,220, Cl. 426-61.000.
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Iriyama, Norio; Shijo, Kunio; and Aoki, Yutaka, 4,908,714, Cl. 358-405.000.
Shikoku Kakoki Co., Ltd.: *See*—
Ueda, Kazuo; and Aihara, Takehiko, 4,907,722, Cl. 222-83.000.
Shimada, Tetsuya, to Canon Kabushiki Kaisha. Image reading apparatus having a light shielding layer arranged on the sides of the substrate and protective layers of a photo sensor. 4,908,718, Cl. 358-494.000.
Shimirak, Gerald L.; Chan, Paul S.; and Messner, Darcey, to Raychem Corporation. Cable closure. 4,908,482, Cl. 174-93.000.
Shimizu, Hiroaki: *See*—
Nemoto, Shusuke; Ishii, Norihiro; and Shimizu, Hiroaki, 4,907,401, Cl. 56-11.300.
Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, to Nippon Petrochemicals Company, Limited. Process for selectively hydroesterifying diolefin. 4,908,473, Cl. 560-104.000.
Shimizu, Mitsuru: *See*—
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Shimizu, Ryuichi: *See*—
Takahashi, Toru; Shimizu, Ryuichi; Suehiro, Tsuomu; and Ashitaka, Hidetomo, 4,908,283, Cl. 429-192.000.
Shimizu, Yoshihiro: *See*—
Morita, Kenichi; and Shimizu, Yoshihiro, 4,908,115, Cl. 204-294.000.
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Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,908,457, Cl. 548-324.000.
Shimojo, Shigeru: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; and Torichigai, Masaaki, 4,907,542, Cl. 122-379.000.
Shimokawa, Kimiaki; and Hoga, Hiroshi, to Oki Electric Industry Co., Ltd. Process for manufacturing a semiconductor device having a contact window defined by an inclined surface of a composite film. 4,908,333, Cl. 437-195.000.
Shimomura, Setsuhiro: *See*—
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,556, Cl. 123-486.000.
Ishii, Shoso; Kuriyama, Minoru; Nishimura, Yukinobu; and Shimomura, Setsuhiro, 4,907,557, Cl. 123-488.000.
Shimozaki, Tetsuya: *See*—
Takeuchi, Shinji; and Shimozaki, Tetsuya, 4,907,759, Cl. 242-246.000.
Shimura, Akihiro: *See*—
Kusano, Hiroshi; Kiniwa, Hideaki; Shimura, Akihiro; and Annaka, Masahiko, 4,908,392, Cl. 521-60.000.
Shinba, Hiroaki: *See*—
Ueda, Shinichi; Ohtaka, Michihiro; Nakayama, Yoshiaki; Shinba, Hiroaki; and Ichikawa, Hiroshi, 4,907,836, Cl. 276-39.100.
Shindo, Osamu; Suzuki, Noboru; and Toji, Shigeo, to Asahi Kogaku Kogyo K.K. Optical filtering device and method for using the same. 4,908,644, Cl. 354-402.000.
Shinko Electric Co., Ltd.: *See*—
Karita, Mitsuji; Shinya, Tsutomu; and Oishi, Tetsuo, 4,908,533, Cl. 310-12.000.
Shinya, Tsutomu: *See*—
Karita, Mitsuji; Shinya, Tsutomu; and Oishi, Tetsuo, 4,908,533, Cl. 310-12.000.
Shiomi, Yutaka; Kamio, Kunimasa; Haraguchi, Satoru; and Naitoh, Shigeki, to Sumitomo Chemical Company, Limited. Thermosetting resin composition. 4,908,417, Cl. 525-422.000.
Shiraki, Takeshi: *See*—
Taki, Kazuhiro; Mitsuyoshi, Yasuhiro; and Shiraki, Takeshi, 4,908,072, Cl. 148-11.50F.
Shiratori, Tatsuya: *See*—
Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, 4,908,662, Cl. 355-218.000.
Shirdavani, Hossain A. Low profile, remotely operable valve. 4,907,676, Cl. 184-1.500.
Shirk, Charles A. Cat toy. 4,907,537, Cl. 119-29.000.
Shirotori, Yozo, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Bearing device. 4,907,897, Cl. 384-446.000.
Shkolnik, Alexander: *See*—
Borodulin, German; Shkolnik, Alexander; Persidsky, Maxim; and Thuroff, Joachim W., 4,907,572, Cl. 606-128.000.
Shoda Iron Works Corporation: *See*—
Shoda, Isao; Fujinawa, Takeshi; and Yazawa, Toshikuni, 4,907,371, Cl. 51-33.00R.
Shoda, Isao; Fujinawa, Takeshi; and Yazawa, Toshikuni, to Mitsubishi Jukogyo Kabushiki Kaisha; and Shoda Iron Works Corporation. Automatic polishing machine. 4,907,371, Cl. 51-33.00R.
Shoji, Hisashi: *See*—
Fuma, Hiroshi; Tamura, Akihiko; Itaya, Masahiko; Shoji, Hisashi; and Soma, Shinobu, 4,908,291, Cl. 430-122.000.
Short, Robert T.: *See*—
Rushforth, Craig K.; Xie, Zhenhua; and Short, Robert T., 4,908,836, Cl. 375-1.000.
Showa Aluminum Kabushiki Kaisha: *See*—
Ushioda, Shunta; Tsukuda, Ichizo; Ohneda, Noboru; and Sukimoto, Minobu, 4,907,735, Cl. 228-173.400.
Shu, Paul: *See*—
Sanchez, J. Michael; Strom, E. Thomas; Shu, Paul; and Alameddine, Bassem R., 4,907,656, Cl. 166-270.000.
Shu, Stephen K.: *See*—
Gregg, David P.; Shu, Stephen K.; and Wilson, Kitchener C., 4,908,815, Cl. 369-116.000.
Shurmer, Harold V., to National Research Development Corporation. Apparatus and method for identifying or measuring gas or liquid borne substances. 4,907,441, Cl. 73-23.000.
Shurulinkov, Stanislav P.: *See*—
Kruglii, Vassil P.; and Shurulinkov, Stanislav P., 4,908,829, Cl. 372-29.000.
Siahatgar, Mohammed T. Modular panel frame assembly system. 4,907,388, Cl. 52-584.000.
Sidewinder Products Corporation: *See*—
Singleton, Robert P., 4,907,476, Cl. 81-57.290.
Siegenia-Frank KG: *See*—
Gerhard, Helmut, 4,907,908, Cl. 403-393.000.
Siemens Aktiengesellschaft: *See*—
Feldtkeller, Martin, 4,908,755, Cl. 363-56.000.
Gall, Arthur; Kuetterer, Gerhard; and Richter, Helmut, 4,908,843, Cl. 378-99.000.
Huang, Rong-Ting; and Kasemset, Dumrong, 4,907,534, Cl. 118-725.000.
Kiehlmann, Horst-Dieter; and Wunderlich, Frank, 4,908,180, Cl. 376-361.000.
Leibe, Gerhard; Kuhlmann, Klaus; and Weiss, Albert, 4,908,824, Cl. 370-85.150.
Oestreich, Ulrich, 4,907,855, Cl. 350-96.230.
Schoenwald, Siegfried, 4,907,945, Cl. 415-117.000.
Soelkner Gerald, 4,908,568, Cl. 324-96.000.
Siemens-Bendix Automotive Electronics L.P.: *See*—
Daly, Paul D., 4,907,547, Cl. 123-52.00M.
Siemens Transmission Systems, Inc.: *See*—
Burns, Robert V.; and Gupta, Sanjay, 4,908,857, Cl. 379-418.000.
Sieroslawski, Donald L.; and Cranford, Luther W. Sliver control drafting cradle. 4,907,318, Cl. 19-255.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Hampejs, Karl, 4,907,492, Cl. 91-49.000.

Sigal, Catherine T.: *See*—
McWilliams, John P.; and Sigal, Catherine T., 4,908,342, Cl. 502-68.000.

Sikkema, Doetze J., to Akzo N.V. Composites comprising an aramid matrix. 4,908,264, Cl. 428-294.000.

Silverman, Kim E. A., to British Telecommunications public limited company. Speech synthesis. 4,908,867, Cl. 381-51.000.

Silverstein, Fred E.: *See*—
Opie, Eric; Silverstein, Fred E.; and Terry, Elizabeth J., 4,907,395, Cl. 53-434.000.

Silvestri, Victor J.; and Tsang, Paul J., to International Business Machines Corporation. Selective epitaxial growth structure and isolation. 4,908,691, Cl. 357-49.000.

Simian, Marie-Therese: *See*—
Jeanneret, Miquel J., 4,907,640, Cl. 164-134.000.

Simmonds Precision Products, Inc.: *See*—
Maier, Lawrence C., 4,908,783, Cl. 364-560.000.

Simmons, Elmer: *See*—
Leis, Michael; Muchnik, Michael J.; Simmons, Elmer; Brown, Russell; and Rub, Bernardo, 4,908,841, Cl. 375-81.000.

Simon, Hubert: *See*—
Mulhaupt, Rolf; Simon, Hubert; and Cotting, Jacques-Alain, 4,908,406, Cl. 525-64.000.

Simon, Mark A.; Knowles, Steve; and Smith, William, to Olin Corporation. Lifetime arcjet thruster. 4,907,407, Cl. 60-203.100.

Simon, Terry L., to Newell Co. Decorative window shade. 4,907,636, Cl. 160-238.000.

Simone, Raymond J., to Automation Equipment Company. Video cassette library retrieval and sequencing system. 4,907,889, Cl. 360-92.000.

Singewald, Nicolas: *See*—
Klotzer, Wilhelm; Mussner, Renate; Montavon, Marc; and Singewald, Nicolas, 4,908,363, Cl. 514-235.800.

Singh, Rishi P.: *See*—
Doherty, Roger D.; and Singh, Rishi P., 4,908,069, Cl. 148-2.000.

Single Buoy Moorings Inc.: *See*—
Poldervaart, Leendert; and Ducousso, Patrick, 4,907,995, Cl. 441-3.000.
Poldervaart, Leendert, 4,907,996, Cl. 441-3.000.

Singleton, Robert P., to Sidewinder Products Corporation. Socket wrench with improved handle. 4,907,476, Cl. 81-57.290.

Sinn, Richard E., to Whirlpool Corporation. Self-cleaning oven temperature control having multiple stored temperature tables. 4,908,760, Cl. 364-400.000.

Sirato, Toshimitsu, to Hitachi, Ltd. Data communications system having a packet switching network. 4,908,821, Cl. 370-60.000.

Sismour, Albert C., Jr., to Westinghouse Electric Corp. Pole ventilation of radially ventilated rotors. 4,908,537, Cl. 310-51.000.

Sizova, Svetlana I.: *See*—
Kozachevsky, Gennady G.; Guskov, Valery V.; Boikov, Vladimir P.; Gorodnichev, Jury N.; Sizova, Svetlana I.; Moroz, Viktor A.; Kachur, Isaak Y.; Kholmovsky, Alexandr S.; and Lapshina, Nadezhda V., 4,908,090, Cl. 156-446.000.

Skidmore, Ian F.: *See*—
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; Campbell, Ian B.; Middlemiss, David; and Willbe, Charles, 4,908,386, Cl. 514-605.000.

Sky Aluminium Co., Ltd.: *See*—
Muramatsu, Toshiki; Matsuo, Mamoru; Tsuchida, Shigeo; and Gungi, Hiroyoshi, 4,908,078, Cl. 148-439.000.

Sloan-Kettering Institute for Cancer Research: *See*—
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore, 4,908,433, Cl. 530-351.000.
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore, 4,908,434, Cl. 530-417.000.

Slupski, Stanislaw, to Slupski, Tomasz. Multiple lobed piston pump with angularly and axially displaced segments and throttle valve. 4,907,954, Cl. 418-200.000.

Slupski, Tomasz: *See*—
Slupski, Stanislaw, 4,907,954, Cl. 418-200.000.

Smart, Melinda K.: *See*—
Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 4,908,027, Cl. 604-890.100.

Smirnoff, Yakov. Device for writing. 4,907,824, Cl. 281-45.000.

Smith Corona Corporation: *See*—
Duncan IV, Howard C., 4,907,900, Cl. 400-63.000.

Smith, Donald L.; McDonald, Curtis L.; and Hicks, Jim R., to Hexcel Corporation. Method and apparatus for making biased fabric. 4,907,323, Cl. 29-2.210.

Smith, Fritz A.: *See*—
Bowes, Emmerson; and Smith, Fritz A., 4,908,120, Cl. 208-59.000.

Smith, Harry F. Parallel data processor. 4,908,751, Cl. 364-200.000.

Smith International, Inc.: *See*—
Kar, Naresh J.; Salesky, William J.; and Guzowski, Steven J., 4,907,665, Cl. 175-410.000.

Smith, Jack W.: *See*—
Philibert, Alex C.; Smith, Jack W.; and Fox, James W., 4,908,873, Cl. 382-34.000.

Smith, Ken: *See*—
Welker, Robert H.; and Smith, Ken, 4,908,567, Cl. 323-299.000.

Smith, Marvin F., Jr., to Exxon Chemical Patents Inc. Oil additive compositions exhibiting reduced haze containing polymeric viscosity index improver. 4,908,146, Cl. 252-56.00R.

Smith, Marvin L., to JFP Energy, Inc. Submersible production storage barge and method for transporting and installing a jack-up rig in a body of water. 4,907,912, Cl. 405-208.000.

Smith, Robert F.: *See*—
Nicholson, Robert D.; Kaake, Steven A. F.; and Smith, Robert F., 4,907,915, Cl. 405-229.000.

Smith, William: *See*—
Simon, Mark A.; Knowles, Steve; and Smith, William, 4,907,407, Cl. 60-203.100.

Smithers, Michael J.: *See*—
Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., 4,908,380, Cl. 514-452.000.

SmithKline Beckman Corporation: *See*—
Callahan, James F.; Huffman, William F.; Newlander, Kenneth A.; and Yim, Nelson C. F., 4,908,475, Cl. 560-115.000.

Smolders, Cornelius A.; Franken, Antonius C. M.; and Mulder, Marcellinus H. V., to Akzo NV. Process for the production of a bilayer membrane. 4,908,235, Cl. 427-243.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Diel, Hartmut; and Hartmann, Hans-Heinrich, 4,907,439, Cl. 72-247.000.

Smyczek, Peter J.; and Thompson, John A. Laboratory apparatus. 4,908,319, Cl. 435-285.000.

Snipes, Jerry T. Drywall finishing tool. 4,907,955, Cl. 425-87.000.

Snowden, Gregory O.; DeLuca, Joan S.; and Pace, Gary L., to Motorola, Inc. Electronic circuit with power drain control. 4,908,523, Cl. 307-43.000.

Snyder, David B., to University of Maryland, The. Competitive elisa for determination of neutralizing IBDV antibody. 4,908,305, Cl. 435-5.000.

Snyder, Francis H., Jr., to Olaf Kayser; and Meyerie, George. Home chocolate processing apparatus. 4,907,502, Cl. 99-455.000.

Snyder, Gene L.: *See*—
Gallusser, David O.; and Snyder, Gene L., 4,907,981, Cl. 439-258.000.

Snyder General Corporation: *See*—
Mahanay, Herbert S.; and Hoeffken, Russell W., 4,907,420, Cl. 62-291.000.

Societa Chimica Larderello S.p.A.: *See*—
Vasconi, Antonio; and Mazzinghi, Paolo, 4,908,196, Cl. 423-278.000.

Societe Anonyme dite : ALSTHOM: *See*—
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,907,645, Cl. 165-41.000.

Societe Cooperative Agricole de Canet: *See*—
Modot, Marcel; De Lapasse, Philippe; and Maistre, Francois, 4,908,219, Cl. 426-15.000.

Societe d'Etudes, de Realisations et d'Applications Techniques: *See*—
Arene, Francois, 4,907,512, Cl. 102-476.000.

Societe Francaise d'Etudes d'Installations Siderurgiques: *See*—
Saget, Pierre, 4,907,913, Cl. 405-211.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Bouiller, Jean G.; Jourdain, Gerard E. A.; and Loubet, Marc G., 4,907,743, Cl. 239-265.110.

Soelkner Gerald, to Siemens Aktiengesellschaft. Mechanical probe for optical measurement of electrical potentials. 4,908,568, Cl. 324-96.000.

Soga, Tasao: *See*—
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.

Sogge, John W., to FMC Corporation. Container translating and orienting apparatus and method. 4,907,692, Cl. 198-780.000.

Sohara, Joseph A.: *See*—
Mullay, John J.; and Sohara, Joseph A., 4,907,368, Cl. 44-51.000.

Sohma, Kenichi: *See*—
Azuhata, Shigeru; Narato, Kiyoshi; Kobayashi, Hironobu; Sohma, Kenichi; Inada, Tooru; Arashi, Norio; Miyadera, Hiroshi; and Masutani, Masao, 4,907,962, Cl. 431-174.000.

Sojka, Richard J., to Rockwell International Corporation. High voltage pulse power converter. 4,908,524, Cl. 307-107.000.

Solcz, Edward J.: *See*—
dejong, Joannes N. M.; Solcz, Edward J.; and Wrobbel, Edward J., 4,907,834, Cl. 294-88.000.

Solie, Leland P., to Unisys. Saw tapered transducers. 4,908,542, Cl. 310-313.00B.

Soll, Richard M.; and Dollings, Paul J., to American Home Products Corporation. Benzopyran derivatives and antihypertensive use thereof. 4,908,378, Cl. 514-414.000.

Sollinger, Hans-Peter, to J. M. Voith GmbH. Deflection compensating device for a smoothing device for a coating applying unit. 4,907,528, Cl. 118-121.000.

Soma, Shinobu: *See*—
Fuma, Hiroshi; Tamura, Akihiko; Itaya, Masahiko; Shoji, Hisashi; and Soma, Shinobu, 4,908,291, Cl. 430-122.000.

Soma, Takao: *See*—
Oda, Isao; and Soma, Takao, 4,908,256, Cl. 428-133.000.

Somar Corporation: *See*—
Sumi, Sigeo, 4,908,093, Cl. 156-584.000.

Sonobe, Hiraku: *See*—
Hara, Hiroshi; Sonobe, Hiraku; Shihou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, 4,907,858, Cl. 350-286.000.

Sonobe, Yoshiaki, to Kabushiki Kaisha Toshiba. Digital magnetic recording/reproduction apparatus and method. 4,908,722, Cl. 360-46.000.

Sony Corporation: *See*—
Iwahashi, Yuuji, 4,908,725, Cl. 360-132.000.

Majima, Osamu; Kakinuma, Koichiro; Naganuma, Tohru; and Ando, Makoto, 4,908,711, Cl. 358-296.000.
Ohyama, Masao; and Nagasawa, Tsuyoshi, 4,908,723, Cl. 360-85.000.
Toyama, Takashi; Ohzeki, Minoru; and Yukawa, Takahiro, 4,908,547, Cl. 313-471.000.

Sorgi, Kirk L.: *See*—
Maryanoff, Bruce E.; Maryanoff, Cynthia A.; McComsey, David F.; and Sorgi, Kirk L., 4,908,450, Cl. 546-94.000.

Souders, Karen. Jewelry holder. 4,907,704, Cl. 211-13.000.

Southwest Research Institute: *See*—
Burrahm, Robert W., 4,907,544, Cl. 123-26.000.

Sowa, Nobuhiro; and Koroku, Syuichiro, to Sumitomo Rubber Industries, Ltd.; and Osaka Diamond Industrial Co. Wire saw. 4,907,564, Cl. 125-21.000.

Spada, Lon T.; and Wilczynski, Joseph J., to Union Oil of California. Pressure sensitive adhesives of acetoacetoxy-alkyl acrylate polymers. 4,908,403, Cl. 524-818.000.

Spahni, Milton D.: *See*—
Baird, James C.; Koger, Thurman J., II; Muckenfuhs, Delmar R.; and Spahni, Milton D., 4,908,247, Cl. 428-34.900.

Spangenberg, Melvin. Pipe joint assembly. 4,907,829, Cl. 285-24.000.

Special Projects Research Corporation: *See*—
Hart, David W.; Dunas, Bohdan; and Krulikowski, Joseph, 4,907,524, Cl. 114-356.000.

Specker, Hugo; and Schaffner, Paul, to Viscosuisse S.A. Crimped polyester-yarn from cold drawn polyester-POY-yarn and process for its manufacture. 4,908,269, Cl. 428-369.000.

Spector, George: *See*—
Taylor, Therese A.; and Spector, George, 4,908,066, Cl. 108-26.000.

Spectra-Physics, Inc.: *See*—
Ake, DuWain K., 4,907,874, Cl. 356-4.000.
Baer, Thomas M., 4,908,832, Cl. 372-75.000.

Spectrum Associates, Inc.: *See*—
Meisenheimer, Daniel T., Jr.; and Ho, David T., 4,907,622, Cl. 138-31.000.

Speed Sort, Inc.: *See*—
Butcher, R. E.; and Henderson, A. A., Jr., 4,907,699, Cl. 209-3.300.

Spencer, Treesa A. Blood collector cylinder with needle ejector. 4,907,600, Cl. 128-764.000.

Speranza, Donald: *See*—
Hoppie, Lyle O.; and Speranza, Donald, 4,908,553, Cl. 318-382.000.

Spies, Johann W.: *See*—
Oberweiler, Gunter; Spies, Johann W.; Wirthwein, Udo; and Weber, Friedhelm, 4,907,740, Cl. 238-238.000.

Spirres, Jurgen: *See*—
Finsterwalder, Klemens; and Spirres, Jurgen, 4,908,129, Cl. 210-170.000.

Spohn, Lawrence M., to Alberta Energy Company, Ltd. et al. Device for removing a compacted oil sand layer from a conveyor belt. 4,907,690, Cl. 198-498.000.

Spotholz, Clifford H.; and Scarsella, Edward L., to General Foods Corporation. Container for collecting, preserving, and serving hot beverages. 4,907,719, Cl. 222-1.000.

Sprague Electric Company: *See*—
Ross, Sidney D.; Maher, Galeb H.; and Hutchins, Clinton E., 4,908,338, Cl. 501-1.000.

Sprenkels, Adrianus J.; and Bergveld, Piet, to Microtel B.V. Electro-acoustic transducer of the so-called "electret" type, and a method of making such a transducer. 4,908,805, Cl. 367-181.000.

SPS Technologies, Inc.: *See*—
Doherty, Roger D.; and Singh, Rishi P., 4,908,069, Cl. 148-2.000.

Squires, John J.: *See*—
Dranchak, David W.; Engle, David E.; Hessian, David E.; Knight, Alan D.; Ma, Wai M.; Macek, Thomas G.; and Squires, John J., 4,907,975, Cl. 439-67.000.

Staggs, Arnol; and Flores, Margarita. Interchangeable sectional mining drill and bolt driver system. 4,907,660, Cl. 175-320.000.

Stake, Esbjorn; and Magnusson, Lennart, to Mecania AB. Container for transporting long objects, especially rolls for papermaking machines. 4,907,697, Cl. 206-446.000.

Stal Samifi S.p.A.: *See*—
Battistella, Guido, 4,907,421, Cl. 62-341.000.

Stambaugh, Bruce D.: *See*—
Bland, Ralph H.; Peper, William A.; and Stambaugh, Bruce D., 4,908,278, Cl. 428-500.000.

Stamm, Peter, to Kortenbach Verwaltungs-und Beteiligungung Sgesellschaft mbH & Co. Carrying attachments for umbrellas. 4,907,614, Cl. 135-20.00R.

Standard Manufacturing Company, Inc.: *See*—
Mankey, Harry S., 4,907,935, Cl. 414-495.000.

Standard Microsystems Corporation: *See*—
Ma, Di; and Hoffman, David H., 4,908,326, Cl. 437-44.000.

Standard Oil Company, The: *See*—
Frechette, Francis J.; Boecker, Wolfgang D. G.; McMurtry, Carl H.; and Kasprzyk, Martin R., 4,908,340, Cl. 501-95.000.
Loza, Roman; and Cyngier, Roseann M., 4,908,141, Cl. 252-8.554.

Stangl, Gerald A.; Lee, Douglas W.; and Wilson, Dirk A., to Gas Research Institute. Percussive mole boring device with electronic transmitter. 4,907,658, Cl. 175-19.000.

Stanley, Ann E.; and Godbey, Susan E., to United States of America, Army. Laser-induced nitration. 4,908,110, Cl. 204-157.610.

Stanzl, Robert: *See*—
Wittmann, Heinz; Stritzl, Karl; Luschnig, Franz; Stanzl, Robert; and Himmetsberger, Alois, 4,907,353, Cl. 36-117.000.

Stapelfeld, Norval D.: *See*—
Apsell, Sheldon P.; and Stapelfeld, Norval D., 4,908,629, Cl. 342-457.000.

Starloy Industrial Co., Ltd.: *See*—
Ohtsuka, Nobuo, 4,908,462, Cl. 556-147.000.

Starr, Stephen G.: *See*—
Conru, H. Ward; Gons, Stephen E.; Osborne, Gordon C., Jr.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., 4,907,734, Cl. 228-123.000.

Staubach, Ernst J., to Henkel Corporation. Concentric tube ozonator. 4,908,189, Cl. 422-186.190.

Stauffer, Larry R.: *See*—
Egner, Walter A.; Schaffer, Ronald R.; Stauffer, Larry R.; and Warner, Gary N., 4,907,335, Cl. 29-283.500.

Stavisky, Theodore: *See*—
Corey, Ronald J.; and Stavisky, Theodore, 4,907,628, Cl. 140-105.000.

Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kusnierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, to Instytut Przemyslu Farmaceutycznego; Centrum Baden Molekularnych i Makromolekularnych -PAN; and Instytut Immunologii i Terapii Doswiadczalnej -PAN. Process for the production of 1,3,2-oxazaphosphorinanes. 4,908,464, Cl. 558-81.000.

Steeden, Terry T.: *See*—
Box, Gary W.; Foote-Lennox, Thomas S.; Herreid, Rodney G.; Hoff, James F.; Leisz, Dennis J.; Perlick, John A.; Steeden, Terry T.; Turner, John J.; and Alexander, Curtis R., 4,908,784, Cl. 364-569.000.

Steer, John E.: *See*—
Crumb, Donald A.; Gaiser, Robert F.; and Steer, John E., 4,908,522, Cl. 303-9.720.

Steinmetz, John H.: *See*—
Breault, Michelle S.; and Steinmetz, John H., 4,908,770, Cl. 364-464.020.

Stemmer, Alois: *See*—
Aichele, Karl; Kramer, Wolfgang; Lang, Ernst; Linssen, Mathias; Stemmer, Alois; and Wissmann, Michael, 4,907,746, Cl. 239-472.000.

Stempin, David R. Tank stabilizer. 4,907,712, Cl. 220-69.000.

Stendel, Wilhelm: *See*—
Jensen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, 4,908,377, Cl. 514-404.000.

Stepaniuk, Nickolas J.; and Lamb, Bruce J., to Mallinckrodt, Inc. Continuous preparation of nitrosyl fluoride. 4,908,270, Cl. 423-386.000.

Stephan, Walter A.: *See*—
Fischer, Josef; and Stephan, Walter A., 4,908,254, Cl. 428-119.000.

Sterzel, Hans-Josef; and Mair, Gunther, to BASF Aktiengesellschaft. Production of ceramic moldings. 4,908,172, Cl. 264-63.000.

Sterzycki, Roman Z.; Mansuri, Muzammil M.; and Martin, John C., to Bristol Myers Company. 2',3'-dideoxy-2'-fluoroarabinopyrimidine nucleosides. 4,908,440, Cl. 536-23.000.

Stetter, Jorg: *See*—
Jensen-Korte, Uta; Schallner, Otto; Stetter, Jorg; Andrews, Peter; Becker, Benedikt; Homeyer, Bernhard; Stendel, Wilhelm; and Behrenz, Wolfgang, 4,908,377, Cl. 514-404.000.

Steuck, Michael J.: *See*—
Pitt, Aldo M.; and Steuck, Michael J., 4,908,236, Cl. 427-245.000.

Stewart, Richard M. Bookholder for reclined reading. 4,907,777, Cl. 248-453.000.

Stewart, Thomas G., Jr.: *See*—
Dewhirst, Kenneth C.; and Stewart, Thomas G., Jr., 4,908,424, Cl. 528-97.000.

Stewart Warner Corporation: *See*—
Nickolaus, Robert D., 4,908,806, Cl. 368-9.000.

Stewart, William E., Jr.; Greer, Michael E.; and Dona, Carol L. G., to Curator of the University of Missouri, The. Slush ice making system and methods. 4,907,415, Cl. 62-66.000.

Stiller, Gordon L.: *See*—
Hubbell, James C.; Stiller, Gordon L.; and Liegeois, David D., 4,907,638, Cl. 164-45.000.

Stoehr, Roland R., to International Business Machines Corporation. Contact probe assembly with fine positioning means. 4,908,571, Cl. 324-158.00P.

Stone Jr., Richard F.: *See*—
Kling, John P.; and Stone Jr., Richard F., 4,908,586, Cl. 333-182.000.

Storage Technology Corporation: *See*—
Wolfe, Samuel J., 4,908,777, Cl. 364-513.000.

Storck, Alain: *See*—
Horbez, Dominique; Storck, Alain; and Grosbois, Jean, 4,908,108, Cl. 204-93.000.

Strategic Financial Communications Corp.: *See*—
Baldwin, Judith A. M., 4,907,904, Cl. 402-80.00R.

Straub, Ferdinand: *See*—
Goertz, Hans-Helmut; Straub, Ferdinand; Vogel, Friedrich; Frosch, Franz; Naegele, Paul; and Raubenheimer, Hans-Juergen, 4,908,413, Cl. 525-304.000.

Strauss, Andreas L. Apparatus for simultaneous determination of ophthalmic artery blood pressure and flow. 4,907,595, Cl. 128-661.060.

Stritzl, Karl: *See*—
Wittmann, Heinz; Stritzl, Karl; Luschnig, Franz; Stanzl, Robert; and Himmetsberger, Alois, 4,907,353, Cl. 36-117.000.

Strom, E. Thomas: *See*—
Sanchez, J. Michael; Strom, E. Thomas; Shu, Paul; and Alameddine, Bassem R., 4,907,656, Cl. 166-270.000.

Strom, Lauri A.; Carnall, Edward, Jr.; Ferranti, Steven A.; and Mir, Jose M., to Eastman Kodak Company. Crystalline rare earth alkaline earth copper oxide thick film circuit element with superconducting onset transition temperature in excess of 77%. 4,908,346, Cl. 505-1.000.

Stroomer, Martinus V. C., to U.S. Philips Corporation. Color display device. 4,908,609, Cl. 340-702.000.

Stuchlik, Charles F., III. Outlet box covers with location indicators for wall covering. 4,907,711, Cl. 220-3.800.

Su "Klimmt Ohridski": *See*—
Krugiii, Vassil P.; and Shurulinkov, Stanislav P., 4,908,829, Cl. 372-29.000.

Suda, Shigeyuki: *See*—
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,907,866, Cl. 350-426.000.

Suda, Yasuo: *See*—
Higashihara, Masaki; Suda, Yasuo; Ohwaki, Ichiro; Akashi, Akira; and Kadohara, Terutake, 4,908,645, Cl. 354-402.000.

Sudare, Masahiro; Tomikawa, Hisao; and Minami, Mamoru, to Mitsubishi Denki Kabushiki Kaisha. Running control method and apparatus of the automatic guided vehicles. 4,908,557, Cl. 318-587.000.

Sudol, Charles W.: *See*—
Bouchard, William L.; Sudol, Charles W.; and Wing, Keith E., Sr., 4,907,376, Cl. 51-209.00R.

Suehiro, Shigeo: *See*—
Kusaka, Kazuo; Suehiro, Shigeo; Tajiri, Noboru; Nakamura, Kiyoshi; and Okimoto, Tsuyoshi, 4,907,784, Cl. 266-235.000.

Suehiro, Tsuomu: *See*—
Takahashi, Toru; Shimizu, Ryuichi; Suehiro, Tsuomu; and Ashitaka, Hidetomo, 4,908,283, Cl. 429-192.000.

Suetake, Naruki: *See*—
Inada, Masanori; Suetake, Naruki; Ohtani, Hichiro; and Yamakawa, Tomoya, 4,907,446, Cl. 73-118.200.

Sugahara, Sumio. Pneumatic cylinder with integral concentric hydraulic cylinder-type axially compact brake. 4,907,495, Cl. 92-9.000.

Sugimoto, Tadao: *See*—
Miyasaka, Tsutomu; Tani, Tadaaki; and Sugimoto, Tadao, 4,908,303, Cl. 430-569.000.

Sugimura, Hiroshi: *See*—
Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,908,457, Cl. 548-324.000.

Sugimura, Kazuo: *See*—
Sugimura, Nobuyuki; and Sugimura, Kazuo, 4,907,621, Cl. 138-30.000.

Sugimura, Nobuyuki; and Sugimura, Kazuo. Bladder-type accumulator with movable cup-shaped sensor. 4,907,621, Cl. 138-30.000.

Sugitani, Kazumi: *See*—
Karasaki, Toshihiko; and Sugitani, Kazumi, 4,908,504, Cl. 250-201.200.

Sugiura, Kazuo; and Takeuchi, Takashi, to Kabushiki Kaisha Shinkawa. Pellet-lifting apparatus. 4,907,790, Cl. 269-21.000.

Sukiennik, Corrine A.; and Becker, Mollie M., to Kimberly-Clark Corporation. Flow distribution system for absorbent pads. 4,908,026, Cl. 604-378.000.

Sukimoto, Minobu: *See*—
Ushioda, Shunta; Tsukuda, Ichizo; Ohneda, Noboru; and Sukimoto, Minobu, 4,907,735, Cl. 228-173.400.

Sulzer Brothers Limited: *See*—
Deckner, Andre G.; Imhof, Martin; and Zweymuller, Karl, 4,908,035, Cl. 623-23.000.
Frey, Otto; and Koch, Rudolf, 4,908,033, Cl. 623-22.000.
Muller, Werner; Hensel, Marie-Claude; and Huber, August, 4,908,013, Cl. 600-36.000.

Sumi, Sigeo, to Sonar Corporation. Film conveying apparatus. 4,908,093, Cl. 156-584.000.

Sumitomo Chemical Company, Limited: *See*—
Shiomi, Yutaka; Kamio, Kusumasa; Haraguchi, Satoru; and Naitoh, Shigeki, 4,908,417, Cl. 525-422.000.
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 4,908,455, Cl. 548-268.400.

Sumitomo Electric Industries, Ltd.: *See*—
Nishiguchi, Masanori, 4,908,693, Cl. 357-68.000.
Yamashita, Yukinori; Iwata, Kouichi; and Sakagami, Seigou, 4,907,677, Cl. 188-73.100.

Sumitomo Light Metal Industries, Ltd.: *See*—
Hoshino, Ikuya; Kimura, Hiroshi; Maekawa, Yukihiro; and Fujimoto, Takayuki, 4,907,434, Cl. 72-8.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Sowa, Nobuhiro; and Koroku, Syuichiro, 4,907,564, Cl. 125-21.000.

Sumiya, Takashi: *See*—
Tsunashima, Kenji; Mimura, Takashi; Sumiya, Takashi; and Kaboyama, Hiroshi, 4,908,277, Cl. 428-480.000.

Summerlin, Frederick A.: *See*—
Jeal, Harvey P.; and Summerlin, Frederick A., 4,907,922, Cl. 411-43.000.

Sun Microsystems, Inc.: *See*—
Priem, Curtis; Webber, Thomas; and Malachowsky, Chris, 4,908,780, Cl. 364-521.000.

Sunbeam Corporation: *See*—
Jauch, Christian M., 4,908,807, Cl. 368-89.000.

Suncast Corporation: *See*—
Whitehead, Stephen P.; and Ferguson, Michael D., 4,907,742, Cl. 239-230.000.

Suncor Corporation: *See*—
Baskin, David, 4,908,257, Cl. 428-147.000.

Sundberg, Kenneth R., to Phillips Petroleum Company. Spectral data processing method for detection of hydrocarbons. 4,908,763, Cl. 364-420.000.

Sundstrand Corporation: *See*—
Cook, Alexander; and Reynolds, Richard W., 4,908,565, Cl. 322-10.000.

Suntola, Tuomo S., to Oy Lohja Ab. Method for generating electronically controllable color elements and color display based on the method. 4,907,862, Cl. 350-345.000.

Superba, S.A.: *See*—
Enderlin, Robert, 4,907,310, Cl. 8-149.200.

Sure Alloy Steel: *See*—
Wark, Rickey E.; and Cunningham, James R., 4,907,751, Cl. 241-119.000.

Surgikos, Inc.: *See*—
McAmish, Larry H.; Addy, Tralance O.; and Lee, George F., 4,908,163, Cl. 264-12.000.

Susemihl, Ingo, to Midwest Research Institute. Method and apparatus for optimizing the efficiency and quality of laser material processing. 4,908,493, Cl. 219-121.670.

Susko, Robin A.: *See*—
Jones, Carol R.; and Susko, Robin A., 4,908,094, Cl. 156-633.000.

Sutton, Christopher; and Colburn, Richard. Circuit module for multipin connector. 4,908,597, Cl. 338-21.000.

Sutton, Tonja R.: *See*—
Miller, Theodore E., Jr.; Sutton, Tonja R.; and Latta, Charles J., 4,908,168, Cl. 264-40.100.

Suur-Askola, Seppo, to Kone Elevator GmbH. Method and device for braking a squirrel-cage motor. 4,908,563, Cl. 318-760.000.

Suwa, Kyoichi; Hirukawa, Shigeru; and Tateno, Hiroki, to Nikon Corporation. Method of dimension measurement for a pattern formed by exposure apparatus, and method for setting exposure conditions and for inspecting exposure precision. 4,908,656, Cl. 355-53.000.

Suzuka, Susumu: *See*—
Niimura, Isao; Nagasaka, Hideo; Takeuchi, Manabu; Nita, Toshiyuki; and Suzuka, Susumu, 4,908,225, Cl. 427-25.000.

Suzukamo, Gohfu: *See*—
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 4,908,455, Cl. 548-268.400.

Suzuki, Eiichi; Yokoyama, Kenji; and Noro, Masao, to Yamaha Corporation. DC-to-DC voltage-increasing power source. 4,908,752, Cl. 363-17.000.

Suzuki, Hideo; Fujita, Yoshio; and Kuribayashi, Hirotaka, to Yamaha Corporation. Tone signal processing device using a digital filter. 4,907,484, Cl. 84-661.000.

Suzuki, Hiroyuki: *See*—
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.

Suzuki, Minoru, to Ricoh Company, Ltd. Color image forming apparatus having a synchronized conveyor. 4,908,675, Cl. 355-326.000.

Suzuki, Naoyuki: *See*—
Kobari, Katsuo; Ota, Naoto; Suzuki, Naoyuki; and Kanamori, Yuji, 4,908,738, Cl. 361-429.000.

Suzuki, Noboru: *See*—
Shindo, Osamu; Suzuki, Noboru; and Toji, Shigeo, 4,908,644, Cl. 354-402.000.

Suzuki, Susumu; Yagi, Sumio; Hakamata, Naotoshi; and Ozaki, Takeo, to Hamamatsu Photonics Kabushiki Kaisha. Examination apparatus for measuring oxygenation in body organs. 4,907,876, Cl. 356-41.000.

Suzuki, Susumu; Yagi, Sumio; Hakamata, Naotoshi; and Ozaki, Takeo, to Hamamatsu Photonics Kabushiki Kaisha. Oximeter with system for testing transmission path. 4,908,762, Cl. 364-413.090.

Suzuki, Tomio: *See*—
Hikosaka, Akihide; Mimura, Tsuyoshi; Suzuki, Tomio; Yoshigae, Takeo; and Ito, Shuzo, 4,908,059, Cl. 75-43.000.

Sweeney, Harold E.: *See*—
Leonard, Donald A.; and Sweeney, Harold E., 4,907,887, Cl. 356-352.000.

Synthelabo: *See*—
Bobee, Jean-Marc; and Melin, Christian, 4,908,214, Cl. 424-477.000.

Sze, Isaac S. Y.: *See*—
Greenwald, Richard B.; and Sze, Isaac S. Y., 4,908,381, Cl. 514-460.000.

Szelejewski, Wieslaw: *See*—
Stec, Wojciech J.; Radzikowski, Czeslaw; Szelejewski, Wieslaw; Kinas, Ryszard; Misiura, Konrad; Grynkiewicz, Grzegorz; Grodner, Jacek; Kuniierczyk, Halina; Kutner, Andrzej; and Pilichowska, Slawomira, 4,908,464, Cl. 558-81.000.

T.A.V., Inc.: *See*—
Brungardt, Trueman A., 4,908,044, Cl. 44-7.600.

T. Y. Lin International: *See*—
Yang, Y. C.; and Chow, Philip Y., 4,907,312, Cl. 14-21.000.

Tabai Espec Co. Ltd.: *See*—
Nagashima, Tsuneo; and Yamane, Makoto, 4,908,050, Cl. 55-400.000.

Tabata, Yutaka; Nishikawa, Toshio; and Sakai, Hiroshi, to Central Glass Company, Limited. Grinding stone dressing device. 4,907,370, Cl. 51-5.00D.

Tachi-S Co., Ltd.: *See*—
Nemoto, Akira, 4,907,776, Cl. 248-430.000.

Tachiki, Tomoko: *See*—
Nakayama, Akihiro; and Tachiki, Tomoko, 4,907,809, Cl. 273-242.000.

Tada, Yasuo; and Akazawa, Akinori, to Mitsubishi Denki Kabushiki Kaisha. Vortex flow meter. 4,907,459, Cl. 73-861.240.

Tadokoro, Michihiro; and Okada, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Information-carrying medium equipment for magneto-optic reading and writing. 4,908,809, Cl. 369-13.000.

Tag Investments, Inc.: *See*—
Thacker, Derek A., 4,908,160, Cl. 252-608.000.

Taguchi, Tetsu; and Ikeda, Shigeji. Multi-pulse coding system. 4,908,863, Cl. 381-36.000.

Tai, Roland, to Innovare Resourceful Marketing Group, Inc. System for identifying heavy product purchasers who regularly use manufacturers' purchase incentives and predicting consumer promotional behavior response patterns. 4,908,761, Cl. 364-401.000.

Tajima, Keiichi: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,908,560, Cl. 318-603.000.

Tajima, Koji: *See*—
Hirose, Yasushi; Iijima, Kenji; Kashima, Humihiro; Kurita, Naoyasu; Tajima, Koji; and Hondou, Hiroshi, 4,908,400, Cl. 524-303.000.

Tajiri, Noboru: *See*—
Kusaka, Kazuo; Suehiro, Shigeo; Tajiri, Noboru; Nakamura, Kiyoshi; and Okimoto, Tsuyoshi, 4,907,784, Cl. 266-235.000.

Takada, Yoshihiro; and Hosono, Nagao, to Canon Kabushiki Kaisha. Liquid crystal device and image forming apparatus utilizing liquid crystal device. 4,907,859, Cl. 350-331.00T.

Takagi, Atsushi, to Fuji Photo Film Co., Ltd. Jam detecting and displaying device in an image recording apparatus. 4,908,655, Cl. 355-50.000.

Takagi, Osamu: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Takagi, Osamu, 4,908,652, Cl. 335-27.000.
Sago, Akira; Ueda, Masashi; Takagi, Osamu; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,908,653, Cl. 355-27.000.

Takagi, Yoshihiro: *See*—
Katoh, Kazunobu; Takagi, Yoshihiro; Kameoka, Kimitaka; Miyata, Junji; and Ukai, Toshinao, 4,908,293, Cl. 430-264.000.

Takahashi, Hideyuki: *See*—
Takizawa, Masahiro; and Takahashi, Hideyuki, 4,908,233, Cl. 427-213.350.

Takahashi, Kazuki: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,908,560, Cl. 318-603.000.

Takahashi, Mitsuasa, to NEC Corporation. Power MOSFET having a current sensing element of high accuracy. 4,908,682, Cl. 357-23.400.

Takahashi, Mitsugu: *See*—
Kaibuki, Shigeo; Watanabe, Shinpei; Takahashi, Mitsugu; and Moriya, Hiroshi, 4,907,331, Cl. 29-213.100.

Takahashi, Toru; Shimizu, Ryuichi; Suehiro, Tsuomu; and Ashitaka, Hidetomo, to UBE Industries, Ltd. Preparation of ion conductive solid electrolyte. 4,908,283, Cl. 429-192.000.

Takahashi, Tsunehide, to Ricoh Company, Ltd. High-tension power supply for an image recorder. 4,908,753, Cl. 363-21.000.

Takaki, Shoji: *See*—
Ohsaka, Yohnosuke; and Takaki, Shoji, 4,908,460, Cl. 549-511.000.

Takaki, Usaji; Aoki, Shinobu; Yamamoto, Yoshihiro; and Hara, Isao, to Mitsui Toatsu Chemicals, Inc. Preparation process of cinnamate ester. 4,908,472, Cl. 560-104.000.

Takamatsu, Junichi; and Akiyama, Kazunori, to Mita Industrial Co., Ltd. Image-forming machine. 4,908,668, Cl. 355-274.000.

Takatori Corporation: *See*—
Farina, Thomas E.; and Franklin, Lloyd C., 4,908,456, Cl. 548-312.000.

Takatori Hitech Co., Ltd.: *See*—
Farina, Thomas E.; and Franklin, Lloyd C., 4,908,456, Cl. 548-312.000.

Takatori, Naoki: *See*—
Tamada, Kazukiyo; Takatori, Naoki; Yokoyama, Tsuneo; Mikajiri, Satoshi; Kubota, Mineo; and Saito, Hiroshi, 4,908,643, Cl. 354-400.000.

Takatsu, Kiyoshi: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,908,106, Cl. 204-23.000.

Takatsuka, Jitsuho, to Hasegawa, Hiroshi. Device for confirming whether a lock is locked or unlocked. 4,908,605, Cl. 340-542.000.

Takayanagi, Makoto, to Aisin Seiki Kabushiki Kaisha. Solenoid apparatus. 4,908,593, Cl. 335-255.000.

Takayasu, Oshiga: *See*—
Ichiyasu, Yoji; Fujiwara, Katuhiro; Takayasu, Oshiga; and Kasahara, Toshiro, 4,908,745, Cl. 364-140.000.

Takeda Chemical Industries, Ltd.: *See*—
Naito, Kenzo; and Ishibashi, Yukio, 4,908,444, Cl. 540-230.000.

Takeda, Fuchio; Nojima, Kazuo; and Nakamura, Yasutaka, to Ricoh Company, Ltd. Developer carrier containing electrically conductive filler present in a resin coating layer for use in dry-type image developing device. 4,908,665, Cl. 355-245.000.

Takeda, Hideo: *See*—
Shibata, Norio; Takeda, Hideo; and Sato, Tsunehiko, 4,907,530, Cl. 118-410.000.

Takegawa, Yoshinobu: *See*—
Tsuji, Koji; Yamada, Shuji; and Takegawa, Yoshinobu, 4,908,158, Cl. 252-514.000.

Takemoto, Masao: *See*—
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,908,184, Cl. 420-534.000.

Takemoto, Mitsutoshi: *See*—
Fukano, Masahiko; and Takemoto, Mitsutoshi, 4,908,674, Cl. 355-318.000.

Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, to Nisshin Steel Co., Ltd. Electroplating of fine particles with metal. 4,908,106, Cl. 204-23.000.

Takeuchi, Hiromi: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,908,271, Cl. 428-402.220.

Takeuchi, Manabu: *See*—
Niimura, Isao; Nagasaka, Hideo; Takeuchi, Manabu; Nita, Toshiyuki; and Suzuka, Susumu, 4,908,225, Cl. 427-25.000.

Takeuchi, Shinji; and Shimozaki, Tetsuya, to Daiwa Seiko Co., Ltd. Spinning reel assembly. 4,907,759, Cl. 242-246.000.

Takeuchi, Shirou: *See*—
Eto, Kunihiko; Takeuchi, Shirou; and Shiba, Yasuo, 4,907,461, Cl. 73-862.330.

Takeuchi, Takashi: *See*—
Sugiura, Kazuo; and Takeuchi, Takashi, 4,907,790, Cl. 269-21.000.

Takeuchi, Toshio, to Sanshin Kogyo Kabushiki Kaisha. Trim tab actuator for marine propulsion device. 4,908,766, Cl. 364-448.000.

Taki Chemical Co., Ltd.: *See*—
Okumura, Minoru; Maekawa, Yoshio; Mizuno, Hironori; and Yagiyu, Osamu, 4,908,373, Cl. 514-327.000.

Taki, Kazuhiro; Mitsuyoshi, Yasuhiro; and Shiraki, Takeshi, to Nippon Mining Co., Ltd. In-process formation of hard surface layer on Ti/Ti alloy having high resistance. 4,908,072, Cl. 148-11.50F.

Takigawa, Jun: *See*—
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,908,184, Cl. 420-534.000.

Takiguchi, Haruhisa: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,908,830, Cl. 372-46.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,908,831, Cl. 372-46.000.

Takiura, Norihisa: *See*—
Itou, Takeo; Matsuda, Hidemi; Kamitani, Sakae; and Takiura, Norihisa, 4,908,232, Cl. 427-72.000.

Takizawa, Masahiro; and Takahashi, Hideyuki, to Lion Corporation. Production of microcapsules by simple coacervation. 4,908,233, Cl. 427-213.350.

Talley Automotive Products, Inc.: *See*—
Cuevas, Jess, 4,907,819, Cl. 280-736.000.

Tamada, Kazukiyo; Takatori, Naoki; Yokoyama, Tsuneo; Mikajiri, Satoshi; Kubota, Mineo; and Saito, Hiroshi, to Fuji Photo Film Co., Ltd. Automatic focussing adjusting device. 4,908,643, Cl. 354-400.000.

Tamai, Shoji: *See*—
Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,908,409, Cl. 528-188.000.

Tamaki, Yoshikazu: *See*—
Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, 4,908,667, Cl. 355-256.000.

Tamura, Akihiko: *See*—
Fuma, Hiroshi; Tamura, Akihiko; Itaya, Masahiko; Shoji, Hisashi; and Soma, Shinobu, 4,908,291, Cl. 430-122.000.

Tanaka, Akihiro: *See*—
Tasaki, Yoji; Tanaka, Akihiro; Kurokawa, Koichi; Hattori, Katsuhide; and Amano, Motoyuki, 4,908,079, Cl. 149-2.000.

Tanaka, Hiroyuki; Kin, Seki; and Pu, Lyong S., to Fuji Xerox Co., Ltd. Photoreceptor for electrophotography. 4,908,289, Cl. 430-59.000.

Tanaka, Koichi: *See*—
Yamaue, Satoshi; Tanaka, Koichi; Nakaya, Hiroaki; Yamashita, Takuo; and Yoshida, Masaru, 4,908,603, Cl. 340-525.000.

Tanaka, Masami; and Nagasawa, Masataka, to NEC Corporation. Apparatus for marking high point mark on tire. 4,907,447, Cl. 73-146.000.

Tanaka, Masanori: *See*—
Arai, Masakazu; Endo, Hiroshi; Gotoh, Toshihiro; Yagi, Toshio; Tanaka, Masanori; Saito, Masanori; and Mathuno, Shigeki, 4,908,393, Cl. 521-60.000.

Tanaka, Masato; and Sakakura, Toshiyasu, to Agency of Industrial Science and Technology. Process for preparing α-substituted carbonyl compound. 4,908,451, Cl. 546-267.000.

Tanaka, Ritsuo: *See*—
Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, 4,908,667, Cl. 355-256.000.

Tanaka, Seiya: *See*—
Hayashi, Masaharu; and Tanaka, Seiya, 4,907,682, Cl. 192-58.00B.

Tani, Tadaaki: *See*—
Miyasaka, Tsutomu; Tani, Tadaaki; and Sugimoto, Tadao, 4,908,303, Cl. 430-569.000.

Taniguchi, Hajime: *See*—
Sasaki, Takashi; Taniguchi, Hajime; and Kainuma, Keiji, 4,908,311, Cl. 435-101.000.

Taniguchi, Mansbu; Nagano, Hidenobu; Daido, Toshihiko; Kuramoto, Isao; Nohara, Makoto; and Kyotani, Hirochika, to Koyo Seiko Co., Ltd. Torque sensor. 4,907,460, Cl. 73-862.330.

Taniguchi, Naosato: *See*—
Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,908,285, Cl. 430-1.000.

Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. System for detecting the focus condition of a cata-dioptric lens and interchangeable lens for use therewith. 4,908,505, Cl. 250-201.000.

Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Waterproof camera. 4,908,650, Cl. 354-412.000.

Taniguchi, Nobuyuki: *See*—
Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,908,651, Cl. 354-434.000.

Taniguchi, Takuji: *See*—
Ishikawa, Kazunori; Taniguchi, Takuji; Tsukamoto, Kazumasa; and Goto, Shiro, 4,908,255, Cl. 428-131.000.

Taniguchi, Yoshio: *See*—
Ojima, Masahiro; Terao, Motoyasu; Taniguchi, Yoshio; Imazeki, Shuji; and Tomioka, Yasushi, 4,908,813, Cl. 369-94.000.

Tanimoto, Tetsurou: *See*—
Ogasawara, Shinji; Isomura, Yukio; and Tanimoto, Tetsurou, 4,907,833, Cl. 292-336.300.

Tanis, Dale R., to J. I. Case Company. Combine conveyor. 4,908,002, Cl. 460-114.000.

Tanitsu, Katsuya; Nakayama, Museo; and Sato, Yoshimi, to Tokyo Ohka Kogyo Co., Ltd. Coating solution for use in the formation of metal oxide film. 4,908,065, Cl. 106-287.240.

Tanzawa, Misao: *See*—
Iwata, Nobuo; Sakamoto, Koji; and Tanzawa, Misao, 4,908,661, Cl. 355-211.000.

Tasaki, Yoji; Tanaka, Akihiro; Kurokawa, Koichi; Hattori, Katsuhide; and Amano, Motoyuki, to Nippon Oil and Fats Co., Ltd. Water in oil type emulsion explosive. 4,908,079, Cl. 149-2.000.

Tasson, Brian B.: *See*—
Martwick, Willford E.; and Tasson, Brian B., 4,907,510, Cl. 102-434.000.

Tateno, Hiroki: *See*—
Suwa, Kyoichi; Hirukawa, Shigeru; and Tateno, Hiroki, 4,908,656, Cl. 355-53.000.

Tateoka, Masamichi: *See*—
Hara, Hiroshi; Sonobe, Hiraku; Shihou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, 4,907,858, Cl. 350-286.000.

Tawfik, Mohamed S.; and Senn, Patrice, to Etat Francais, represente par le Ministre Delegue des Postes et Telecommunications, (Centre National d'Etudes des Telecommunications). Switched capacitor sampling filter. 4,908,579, Cl. 328-167.000.

Taylor, David W.; and Baker, Benjamin H., to Cirtek Corporation. Vehicle climate control apparatus. 4,907,490, Cl. 91-36.000.

Taylor, Glenn N., to Hart Enterprises, Inc. Soft tissue core biopsy instrument. 4,907,599, Cl. 128-754.000.

Taylor, Therese A.; and Spector, George, to Taylor, Therese A., a part interest. No spill high chair tray/bowl. 4,908,066, Cl. 108-26.000.

TDK Corporation: *See*—
Ezaki, Joichiro; and Fukuda, Kazumasa, 4,908,727, Cl. 360-135.000.

Teague, Tommy L., to United States of America, Energy. Blank fire configuration for automatic pistol. 4,907,489, Cl. 89-14.500.

Tebbe, Frederick N.: *See*—
Bolt, John D.; Mahler, Walter; Tebbe, Frederick N.; and Young, Robert J., Jr., 4,908,197, Cl. 423-412.000.

Tecco, Thomas C., to Navistar International Transportation Corp. Integral exhaust pipe and bracket for trucks. 4,907,666, Cl. 180-89.200.

Tecumseh Products Company: *See*—
Kandler, William C., 4,907,561, Cl. 123-599.000.
Wisner, Ronald R., 4,907,951, Cl. 417-368.000.

Teijin Limited: *See*—
Ogawa, Yoshinari; Yamashiro, Seiichi; and Hironaka, Katsuhiko, 4,908,407, Cl. 525-113.000.

Tektronix, Inc.: *See*—
Polonio, John D.; Penney, Bruce J.; and Lewis, John, 4,908,621, Cl. 341-120.000.

Telcor, Inc.: *See*—
Hannon, Charles J.; and Gallo, Bruce M., 4,908,847, Cl. 379-61.000.

Teledyne Exploration: *See*—
Bell, Robert R.; and Whitley, Stephen M., 4,908,801, Cl. 367-23.000.

Telefonaktiebolaget L M Ericsson: *See*—
Back, Per Ingvar M., 4,908,562, Cl. 318-696.000.
Lofmark, Bengt G., 4,908,854, Cl. 379-373.000.

Temple University-of the Commonwealth System of Higher Education: *See*—
Colman, Robert W.; and Schmaier, Alvin H., 4,908,431, Cl. 530-387.000.

Temple, Victor A. K., to General Electric Company. Controlled turn-on thyristor. 4,908,687, Cl. 357-38.000.

Tene, Yair. Truss module for load-bearing structures. 4,907,390, Cl. 52-694.000.

Tenex Corporation: *See*—
Alger, Andrew L.; Polhemus, Marlan H.; Cheris, Albert B.; and Gibson, Richard L., 4,907,703, Cl. 211-10.000.

Teodorescu, Ioan V.: *See*—
Casady, Donald R.; and Teodorescu, Ioan V., 4,908,819, Cl. 370-15.000.

Teodorescu, Ionel E.: *See*—
Vasconcellos, Alfred V.; Teodorescu, Ionel E.; Cummings, Joel W.; and McBeth, Dean E., 4,907,591, Cl. 606-154.000.

Terada, Akihiro: *See*—
Toyoda, Kenichi; Toril, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,907,467, Cl. 74-479.000.

Terada, Tadashi: *See*—
Kawano, Mitsumo; and Terada, Tadashi, 4,908,582, Cl. 331-1.00A.

Teramachi, Keiichi; Kawagoe, Haruo; Kumon, Naoki; Hirota, Shinya; Kishie, Hidehiko; Amaki, Tsutomu; and Tsusaka, Harushige, to Matsushita Electric Works, Ltd. Bubbling bathtub system. 4,907,305, Cl. 4-542.000.

Terao, Motoyasu: *See*—
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Ojima, Masahiro; Terao, Motoyasu; Taniguchi, Yoshio; Imazeki, Shuji; and Tomioka, Yasushi, 4,908,813, Cl. 369-94.000.

Teron International Development Corporation Ltd.: *See*—
Teron, William, 4,907,910, Cl. 405-132.000.

Teron, William, to Teron International Development Corporation Ltd. Roof structure for tunnel. 4,907,910, Cl. 405-132.000.

Terry, Elizabeth J.: *See*—
Opie, Eric; Silverstein, Fred E.; and Terry, Elizabeth J., 4,907,395, Cl. 53-434.000.

Terunuma, Hiroshi: *See*—
Sato, Shigemasa; Katayama, Akira; and Terunuma, Hiroshi, 4,908,646, Cl. 354-402.000.

Tesch, Bruce J., to Harris Corporation. Voltage regulator having staggered pole-zero compensation network. 4,908,566, Cl. 323-280.000.

Teutsch, Jean-Georges: *See*—
Costerousse, Germain; Gouin d'Ambrieres, Solange; and Teutsch, Jean-Georges, 4,908,359, Cl. 514-210.000.

Texaco Inc.: *See*—
Bou-Mikael, Sami, 4,907,651, Cl. 166-114.000.

Texas Instruments Incorporated: *See*—
Bayraktaroglu, Burhan, 4,908,615, Cl. 340-917.000.
Chapman, Richard A., 4,908,327, Cl. 437-44.000.
Doddington, George R.; and Bocchieri, Enrico, 4,908,865, Cl. 381-43.000.
Haight, Michael H., 4,908,583, Cl. 331-117.00R.
Ishii, Kaoru; Wilkinson, Thomas F.; Dwyer, Stephen J.; and Cooper, Rick, 4,908,495, Cl. 219-343.000.
McElroy, David J., 4,908,797, Cl. 365-207.000.
Pathak, Bimal; Marshall, Steven P.; and Potts, James F., 4,908,748, Cl. 364-200.000.

Teyssie , Philippe J.: *See*—
Leemans, Luc E.; Uytterhoeven, Herman J.; Teyssie , Philippe J.; Fayt, Roger M.; and de Jaeger, Nikolaas C., 4,908,155, Cl. 252-353.000.

Th. Goldschmidt AG: *See*—
Jachmann, Jurgen; Weitemeyer, Christian; and Wewers, Dietmar, 4,908,274, Cl. 428-452.000.
Ruf, Erich, 4,908,237, Cl. 427-314.000.

Thacker, Derek A., to Tag Investments, Inc. Fire retardant composition. 4,908,160, Cl. 252-608.000.

Thames Water Authority: *See*—
Rodriguez, Alan; Rose, John A.; Waller, Clifford B.; and Doyle, Anthony W., 4,907,911, Cl. 405-154.000.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,908,019, Cl. 604-85.000.

Therm-O-Disc, Incorporated: *See*—
Wells, Gordon K.; and Funk, Bradley D., 4,908,596, Cl. 337-354.000.

Thiebaut, Jacques: *See*—
Graton, Michel; Courcol, Michel-Andre; and Thiebaut, Jacques, 4,908,004, Cl. 464-68.000.

Thiede, Peter: *See*—
Hirschel, Ernst H.; Fleckenstein, Hubert; and Thiede, Peter, 4,907,765, Cl. 244-200.000.

Thio, Yong C.: *See*—
Tidman, Derek A.; Thio, Yong C.; and Goldstein, Yeshayahu Shyke A., 4,907,487, Cl. 89-8.000.

Thompson, John A.: *See*—
Ewener, Patrick C.; Bristow, Duncan J.; Armstrong, Scott W.; Dallaire, Louis C.; and Thompson, John A., 4,908,082, Cl. 156-94.000.
Smyczek, Peter J.; and Thompson, John A., 4,908,319, Cl. 435-285.000.

Thompson, Paul L. Pet restraint. 4,907,541, Cl. 119-96.000.

Thompson, William V. Outboard motor mounting apparatus. 4,907,993, Cl. 440-61.000.

Thomsen, John. Method and apparatus for injecting fluids into an IV line. 4,908,018, Cl. 604-83.000.

Thomsen, Merlin E. Water jet massage apparatus and method. 4,908,016, Cl. 128-66.000.

Thomson Composants Militaires Et Spatiaux: *See*—
Gaudronneau, Yann, 4,908,799, Cl. 365-241.000.

Thomson-CSF: *See*—
Anthouard, Pierre; and Carre, Roland, 4,908,625, Cl. 342-25.000.
Bres, Michel; and Tisserand, Francois, 4,908,549, Cl. 315-5.470.
Clerc, Jean-Michel, 4,908,630, Cl. 343-763.000.

Thoraval, Maurice: *See*—
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,907,645, Cl. 165-41.000.

Thorn EMI plc: *See*—
Green, Ian M., 4,908,613, Cl. 340-719.000.

Thornton, George B., to Johnson & Johnson. Method for inducing HIV neutralizing antibodies using an internal image idiotope. 4,908,203, Cl. 424-86.000.

Thornton, Roy F., to General Electric Company. Superconducting joint for superconducting wires and coils and method of forming. 4,907,338, Cl. 29-599.000.

Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., to Hoechst Aktiengesellschaft. Substituted 3-phenyl-7H-thiazol[3,2-b][1,2,4]-triazin-7-ones. 4,908,364, Cl. 514-243.000.

Thuroff, Joachim W.: *See—*
Borodulin, German; Shkolnik, Alexander; Persidsky, Maxim; and Thuroff, Joachim W., 4,907,572, Cl. 606-128.000.

TI Corporate Services Limited: *See—*
Harrison, Philip G.; and Harris, Peter J. F., 4,908,192, Cl. 423-213.200.

Tice, Ralph. Cutting board assembly. 4,907,789, Cl. 269-13.000.

Tidman, Derek A.; Thio, Yong C.; and Goldstein, Yeshayahu Shyke A., to GT-Devices. Apparatus for and method of accelerating a projectile through a capillary passage and projectile therefor. 4,907,487, Cl. 89-8.000.

Tiger Electronics, Inc.: *See—*
Arad, Abraham; and Kennedy, Melvin, 4,907,804, Cl. 273-93.00R.

Tigney Technology Inc.: *See—*
DeLong, Edward A.; DeLong, Edward P.; Ritchie, George S.; and Rendall, W. Alan, 4,908,098, Cl. 162-16.000.

Tikalsky, Terry, to Indesys, Inc. Method for error free message reception. 4,908,828, Cl. 371-69.100.

Tilghman Wheelabrator Ltd.: *See—*
MacMillan, William R., 4,907,379, Cl. 51-426.000.

Tilse, Wilhelm, to Inovan G.m.b.H. & Co. KG, Metalle und Bauelemente. Contact pin. 4,907,988, Cl. 439-751.000.

Tisserand, Francois: *See—*
Bres, Michel; and Tisserand, Francois, 4,908,549, Cl. 315-5.470.

TIW Systems, Inc.: *See—*
Gates, John, 4,908,827, Cl. 371-43.000.

Tkach, Robert W.: *See—*
Chraplyvy, Andrew R.; Koch, Thomas L.; and Tkach, Robert W., 4,908,833, Cl. 372-96.000.

TMC Corporation: *See—*
Wittmann, Heinz; Stritzl, Karl; Luschnig, Franz; Stanzl, Robert; and Himmetsberger, Alois, 4,907,353, Cl. 36-117.000.

To th, Bela: *See—*
Imre, Dobi; Karabelyos, Peter; Kugyela, Janos; and To th, Bela, 4,908,507, Cl. 250-223.00B.

Tobler, Alfred: *See—*
Beck, Josef; Hachtel, Hans; and Tobler, Alfred, 4,907,928, Cl. 411-387.000.

Togawa, Fumio; Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Ueda, Toru, to Sharp Kabushiki Kaisha. Voice recognition method and apparatus by updating reference patterns. 4,908,864, Cl. 381-43.000.

Tohoku Diving Center Co. Ltd.: *See—*
Yasuda, Mamoru, 4,907,295, Cl. 2-2.10R.

Toji, Shigeo: *See—*
Shindo, Osamu; Suzuki, Noboru; and Toji, Shigeo, 4,908,644, Cl. 354-402.000.

Tokai Chemical Industries, Ltd.: *See—*
Kurimoto, Kazunori, 4,908,170, Cl. 264-46.500.

Tokai Rubber Industries, Ltd.: *See—*
Ito, Hiroaki; and Akiyoshi, Koji, 4,907,625, Cl. 138-126.000.
Noba, Kunihiro; Sakuraba, Yukio; and Urano, Katsuyoshi, 4,907,852, Cl. 350-96.200.
Okazaki, Masaaki; and Kadomura, Itsuro, 4,907,786, Cl. 267-140.100.

Tokuda, Hiroshi: *See—*
Ishikawa, Shigeo; Tokuda, Hiroshi; and Ninomiya, Akira, 4,908,632, Cl. 346-76.0PH.

Tokumaru, Hisashi: *See—*
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,908,505, Cl. 250-201.000.

Tokyo Electric Co., Ltd.: *See—*
Doi, Masahiro, 4,907,902, Cl. 400-249.000.

Tokyo Electron Limited: *See—*
Kagatsume, Satoshi; and Fukasawa, Kazuo, 4,908,095, Cl. 156-643.000.

Tokyo Ohka Kogyo Co., Ltd.: *See—*
Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, 4,908,065, Cl. 106-287.240.

Tomikawa, Hisao: *See—*
Sudare, Masahiro; Tomikawa, Hisao; and Minami, Mamoru, 4,908,557, Cl. 318-587.000.

Tomioka, Kenichi: *See—*
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, 4,908,368, Cl. 514-256.000.

Tomioka, Yasushi: *See—*
Ojima, Masahiro; Terao, Motoyasu; Taniguchi, Yoshio; Imazeki, Shuji; and Tomioka, Yasushi, 4,908,813, Cl. 369-94.000.

Tone, Junsuke: *See—*
Cullen, Walter P.; Oscarson, John R.; Tone, Junsuke; and Maeda, Hiroshi, 4,908,316, Cl. 435-253.400.

Tong, Edric H.: *See—*
Mallory, Chester L.; Tong, Edric H.; and Borglum, Wayne K., 4,907,931, Cl. 414-225.000.

Toor, Irfan A.: *See—*
Boldish, Steven I.; and Toor, Irfan A., 4,908,191, Cl. 423-210.000.

Toppan Moore Co., Ltd.: *See—*
Yoshioka, Isamu, 4,908,010, Cl. 493-357.000.

Toppan Printing Co., Ltd: *See—*
Matsumura, Hidekazu; and Yorimoto, Yoshikazu, 4,908,038, Cl. 902-5.000.

Topre Corporation: *See—*
Hagiwara, Yoshihiko; and Ooshima, Katsumi, 4,907,468, Cl. 74-512.000.

Toray Industries, Inc.: *See—*
Morita, Kenichi; and Shimizu, Yoshihiro, 4,908,115, Cl. 204-294.000.
Tsunashima, Kenji; Mimura, Takashi; Sumiya, Takashi; and Kuboyama, Hiroshi, 4,908,277, Cl. 428-480.000.

Torichigai, Masaaki: *See—*
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; and Torichigai, Masaaki, 4,907,542, Cl. 122-379.000.

Toril, Nobutoshi: *See—*
Toyoda, Kenichi; Toril, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,907,467, Cl. 74-479.000.

Toriu, Takashi; and Iwase, Hiromichi, to Fujitsu Limited. Method and apparatus for extracting pattern contours in image processing. 4,908,872, Cl. 382-22.000.

Torrington Company, The: *See—*
Dickinson, Thorn W., 4,907,898, Cl. 384-564.000.
Rhoads, T. G., 4,907,899, Cl. 384-620.000.

Toshiba Silicone Co., Ltd.: *See—*
Kurita, Atsushi; Hatanaka, Masayuki; and Huy, Sam, 4,908,395, Cl. 522-42.000.

Toyama, Takashi; Ohzeki, Minoru; and Yukawa, Takahiro, to Sony Corporation. Beam index type color cathode ray tube. 4,908,547, Cl. 313-471.000.

Toyo Eizai Kabushiki Kaisha: *See—*
Uda, Masashi; and Oohira, Jun, 4,908,089, Cl. 156-439.000.

Toyo Kohan Co., Ltd.: *See—*
Omura, Hitoshi; Yamada, Katsutada; and Omura, Hideo, 4,908,280, Cl. 428-679.000.

Toyo Tire & Rubber Company Limited: *See—*
Ohara, Riichiro; Iwama, Satoshi; Ida, Eiji; and Isobe, Noriyuki, 4,908,401, Cl. 524-495.000.

Toyoda, Kenichi; Toril, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, to Fanuc Ltd. Structure of first arm of industrial robot having articulated horizontal arms. 4,907,467, Cl. 74-479.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Eto, Kunihiko; Takeuchi, Shirou; and Shiba, Yasuo, 4,907,461, Cl. 73-862.330.

Toyota Jidosha Kabushiki Kaisha: *See—*
Sakai, Kazunori; Wakabayashi, Shinji; and Maehata, Hiromi, 4,908,572, Cl. 324-173.000.

TP Orthodontics, Inc.: *See—*
Kesling, Christopher K., 4,907,966, Cl. 433-37.000.

Traegaardh, Paul; and Nantin, Hans, to AB Tetra Pak. Splicing device for packaging webs. 4,908,091, Cl. 156-502.000.

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Kuijer, William L.; Van As, Jacobus P. K. M.; and Traksel, Frans J., 4,907,998, Cl. 445-9.000.

Travill, Andrew W.: *See—*
Davies, James F.; Lee, Robert S.; Travill, Andrew W.; and Williams, Robert J., 4,908,159, Cl. 252-559.000.

Tredwell, Timothy J.: *See—*
Losee, David L.; Tredwell, Timothy J.; and Boisvert, David M., 4,908,518, Cl. 358-213.230.

Treffer, Frank, to VDO Adolf Schindling AG. Foil for soldering the terminals of an electronic component. 4,908,337, Cl. 439-876.000.

Trethewey, Paul M.: *See—*
Chaplin, Daniel J.; Trethewey, Paul M.; Hansen, Christopher R.; and Angell, R. Barry, 4,908,699, Cl. 358-22.000.

Truth Incorporated: *See—*
Pemberton, Whitley, 4,907,832, Cl. 292-228.000.

TRW Inc.: *See—*
Berenz, John J., 4,908,325, Cl. 437-40.000.

TRW Repa GmbH: *See—*
Fohl, Artur, 4,907,820, Cl. 280-806.000.
Fohl, Artur, 4,907,821, Cl. 280-808.000.

TRW Vehicle Safety Systems Inc.: *See—*
Rumpf, Robert J.; Refior, Lawrence M.; Klebba, Lenard D.; and Corrion, Steven G., 4,907,757, Cl. 242-107.600.

Tsang, Paul J.: *See—*
Silvestri, Victor J.; and Tsang, Paul J., 4,908,691, Cl. 357-49.000.

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Tseng, Chi-Ping, to Du Pont de Nemours, E. I., and Company. Heterocyclic acyl sulfonamides. 4,908,056, Cl. 71-90.000.

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Muramatsu, Toshiki; Matsuo, Mamoru; Tsuchida, Shigeo; and Gungi, Hiroyoshi, 4,908,078, Cl. 148-439.000.

Tsuchimoto, Shuhei: *See*—
Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,908,457, Cl. 548-324.000.
Tsuchiya, Fumio; and Matsubara, Kiyoshi, to Hitachi, Ltd. Semiconductor integrated circuit device with built-in memories. 4,908,795, Cl. 365-189.010.
Tsuchiya, Hiroaki: *See*—
Ishii, Yoshifumi; and Tsuchiya, Hiroaki, 4,908,659, Cl. 355-200.000.
Tsuchiya, Shigetada: *See*—
Matsuzawa, Minoru; Tsuchiya, Shigetada; and Okatani, Toshiyuki, 4,907,535, Cl. 119-14.550.
Tsuchiya, Shozo: *See*—
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, 4,908,420, Cl. 526-76.000.
Tsuchiya, Yasuyuki: *See*—
Ezaki, Kozo; Shigeta, Sadaaki; Sakai, Kazunari; Murakami, Noboru; Tsuchiya, Yasuyuki; and Fujita, Yuichi, 4,907,956, Cl. 425-110.000.
Tsuji, Koji; Yamada, Shuji; and Takegawa, Yoshinobu, to Matsushita Electric Works, Ltd. Electrical contact material and method of preparing same. 4,908,158, Cl. 252-514.000.
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, to Nippon Mining Co., Ltd. Film carrier and method of manufacturing same. 4,908,275, Cl. 428-457.000.
Tsuji, Yasuyuki: *See*—
Arimoto, Akira; Saito, Susumu; Tsuji, Yasuyuki; Namikawa, Osamu; and Mochizuki, Takeshi, 4,908,634, Cl. 346-108.000.
Tsukamoto, Kazumasa: *See*—
Ishikawa, Kazunori; Taniguchi, Takuji; Tsukamoto, Kazumasa; and Goto, Shiro, 4,908,255, Cl. 428-131.000.
Tsukuda, Ichizo: *See*—
Ushioda, Shunta; Tsukuda, Ichizo; Ohneda, Noboru; and Sukimoto, Minobu, 4,907,735, Cl. 228-173.400.
Tsunashima, Kenji; Mimura, Takashi; Sumiya, Takashi; and Kuboyama, Hiroshi, to Toray Industries, Inc. Polyester film. 4,908,277, Cl. 428-480.000.
Tsuneki, Yukio, to Kabushiki Kaisha Toshiba. Electronic apparatus reducing generation of electro magnetic interference. 4,908,735, Cl. 361-406.000.
Tsurusaki, Satoshi: *See*—
Nakashima, Mitsuyoshi; and Tsurusaki, Satoshi, 4,908,248, Cl. 428-355.000.
Tsusaka, Harushige: *See*—
Teramachi, Keiichi; Kawagoe, Harue; Kumon, Naoki; Hirota, Shinya; Kishie, Hidehiko; Amaki, Tsutomu; and Tsusaka, Harushige, 4,907,305, Cl. 4-542.000.
Tucker, Richard J. Method for setting toilet bowls. 4,907,301, Cl. 4-252.00R.
Tucker, Ruth L. System for analyzing the syntactical structure of a sentence. 4,907,971, Cl. 434-167.000.
Tunis, George C., III. Planing hull for multi-hull sail boats. 4,907,518, Cl. 114-56.000.
Turai, Endre, to Nehezipari Muszaki Egyetem. Process and circuit for sampling according to instantaneous signal value, independent from the frequency range of the signal to be recorded. 4,908,622, Cl. 341-122.000.
Turbak, Albin F.: *See*—
McIntosh, Robert H., Jr.; Turbak, Albin F.; and McIntosh, Robert H., Sr., 4,908,209, Cl. 424-409.000.
Turnbull, James. Patio deck sheath. 4,907,387, Cl. 52-177.000.
Turner, Glenn; and Walters, Danny. Trivia board game. 4,907,808, Cl. 273-240.000.
Turner, John J.: *See*—
Box, Gary W.; Foote-Lennox, Thomas S.; Herreid, Rodney G.; Hoff, James F.; Leisz, Dennis J.; Perlick, John A.; Steeden, Terry T.; Turner, John J.; and Alexander, Curtis R., 4,908,784, Cl. 364-569.000.
Tusinski, Joseph: *See*—
Hunter, Billy D.; and Tusinski, Joseph, 4,907,373, Cl. 51-58.000.
Tustison, Randal W.; and Montanari, Dennis G., to Raytheon Company. Thick, impact resistant antireflection coatings for IR transparent optical elements. 4,907,846, Cl. 350-1.600.
UBE Industries, Ltd.: *See*—
Takahashi, Toru; Shimizu, Ryuichi; Suehiro, Tsuomu; and Ashitaka, Hidetomo, 4,908,283, Cl. 429-192.000.
Ube-Nitto Kasei Co., Ltd.: *See*—
Nakasone, Takayoshi; and Yasuda, Kazuo, 4,907,854, Cl. 350-96.230.
Uchida, Taichi: *See*—
Nagashima, Tsuneo; and Yamane, Makoto, 4,908,050, Cl. 55-400.000.
Uchiyama, Tadamitsu; and Iida, Tetsuya, to Minolta Camera Kabushiki Kaisha. Method for tone reproduction in image forming system. 4,908,712, Cl. 358-298.000.
Uclaf, Roussel: *See*—
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 4,908,367, Cl. 514-253.000.
Costerousse, Germain; Gouin d'Ambrieres, Solange; and Teutsch, Jean-Georges, 4,908,359, Cl. 514-210.000.
Uda, Masashi; and Oohira, Jun, to Toyo Eizai Kabushiki Kaisha. Apparatus for making an elasticized unit. 4,908,089, Cl. 156-439.000.
Udagawa, Yoshiro, to Canon Kabushiki Kaisha. Color image processing method and apparatus for color adjustment during image processing. 4,908,701, Cl. 358-80.000.
Udo, Syohei: *See*—
Saito, Toshitaka; Sano, Hiromi; Ota, Soji; and Udo, Syohei, 4,908,119, Cl. 204-426.000.
Ueberreiter, Ekkehard: *See*—
Willberg, Hans-Heinrich; Ueberreiter, Ekkehard; and Schottlfer, Franz, 4,908,126, Cl. 209-573.000.
Ueda, Hiroshi: *See*—
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Tanabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,908,650, Cl. 354-412.000.
Ueda, Kazuo; and Aihara, Takehiko, to Shikoku Kakoki Co., Ltd. Easily openable sealed container. 4,907,722, Cl. 222-83.000.
Ueda, Masashi: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Takagi, Osamu, 4,908,652, Cl. 335-27.000.
Sago, Akira; Ueda, Masashi; Takagi, Osamu; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,908,653, Cl. 355-27.000.
Ueda, Shinichi; Ohtaka, Michihiro; Nakayama, Yoshiaki; Shinba, Hiroaki; and Ichikawa, Hiroshi, to Yazaki Corporation. Wire harness mounting structure for motor vehicle door. 4,907,836, Cl. 276-39.100.
Ueda, Toru: *See*—
Togawa, Fumio; Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Ueda, Toru, 4,908,864, Cl. 381-43.000.
Ueyama, Masayuki, to Minolta Camera Kabushiki Kaisha. Lens driving device. 4,908,647, Cl. 354-402.000.
Ujiie, Noriaki: *See*—
Murooka, Hideyasu; Kyooi, Masayuki; Yamada, Osamu; and Ujiie, Noriaki, 4,908,087, Cl. 156-286.000.
Ujita, Katsu: *See*—
Yoshioka, Takeo; Kobayashi, Masahiro; Minagawa, Tadao; and Ujita, Katsu, 4,908,729, Cl. 361-118.000.
Ukai, Toshinao: *See*—
Katoh, Kazunobu; Takagi, Yoshihiro; Kameoka, Kimitaka; Miyata, Junji; and Ukai, Toshinao, 4,908,293, Cl. 430-264.000.
Ukrainsky Nauchno-Issledovatelsky Institut Prirodnykh Gazov "Ukrniigaz": *See*—
Kiselev, Viktor M., 4,908,051, Cl. 55-457.000.
Ullestad, David C., to Honeywell Inc. Apparatus and method for range control and supply voltage compensation in a dual slope analog to digital converter. 4,908,623, Cl. 341-167.000.
Ulrich, Peter C.; and Cerami, Anthony, to Rockefeller University, The. Inhibitors of nonenzymatic cross-linking. 4,908,446, Cl. 540-553.000.
Umemaru, Hisato: *See*—
Onishi, Masayoshi; Umemaru, Hisato; and Ozawa, Hiromasa, 4,907,668, Cl. 180-142.000.
Underwood, Robert A., to Kimball International, Inc. Panel connection arrangement for a partition system. 4,907,384, Cl. 52-126.600.
Unimation Inc.: *See*—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Booth, Barrett L., 4,908,556, Cl. 318-568.200.
Union Carbide Chemicals and Plastics Company Inc.: *See*—
Bhasin, Madan M., 4,908,343, Cl. 502-218.000.
Nelson, James R., 4,908,466, Cl. 558-488.000.
Union Carbide Corporation: *See*—
Anderson, John E., 4,907,961, Cl. 431-8.000.
Polizzotto, Robert J., 4,907,405, Cl. 60-39.020.
Union Oil Company of California: *See*—
Dumdum, Josefina M.; Mendelson, Leah T.; and Pilling, Richard L., 4,908,142, Cl. 252-17.000.
Dumdum, Josefina M.; Mendelson, Leah T.; and Pilling, Richard L., 4,908,143, Cl. 252-17.000.
Union Oil of California: *See*—
Kissel, Charles L., 4,908,229, Cl. 427-54.100.
Spada, Lon T.; and Wilczynski, Joseph J., 4,908,403, Cl. 524-818.000.
Unionspack Industrielle Lohnverpackuns-GmbH & Co.: *See*—
Tschepke, Josef; Oerther, Bernhard; and Hintermaier, Eduard, 4,907,394, Cl. 53-412.000.
Unique Musical Products, Inc.: *See*—
Wiley, Robert J., 4,907,671, Cl. 181-156.000.
Unisys: *See*—
Solie, Leland P., 4,908,542, Cl. 310-313.00B.
Unisys Corporation: *See*—
Rushforth, Craig K.; Xie, Zhenhua; and Short, Robert T., 4,908,836, Cl. 375-1.000.
United States Data Corporation: *See*—
Vaughn, Mitchell D., 4,908,746, Cl. 364-147.000.
United States of America
Agriculture: *See*—
Vigo, Tyrone L.; Zimmerman, Cynthia M.; Bruno, Joseph S.; and Danna, Gary F., 4,908,238, Cl. 427-389.000.
Air Force: *See*—
Yung, Michael W., 4,908,525, Cl. 307-202.100.
Army: *See*—
Blecha, Bill A., 4,907,296, Cl. 2-6.000.
Stanley, Ann E.; and Godbey, Susan E., 4,908,110, Cl. 204-157.610.
Energy: *See*—
Fontana, Jack J.; Elling, David; and Reams, Walter, 4,908,157, Cl. 252-511.000.
Globig, Michael A.; Johnson, Michael A.; and Wyeth, Richard W., 4,907,885, Cl. 356-349.000.
Jones, Nelson E., 4,907,881, Cl. 356-152.000.
Lieberman, Morton L., 4,907,509, Cl. 102-202.100.
Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, 4,907,731, Cl. 228-2.500.

Teague, Tommy L., 4,907,489, Cl. 89-14.500.
Zuhr, Raymond A.; and Holland, Orin W., 4,908,334, Cl. 437-200.000.

Health and Human Services: *See*—
Jacobson, Kenneth A.; Kirk, Kenneth L.; Linnoila, Markku I.; Miller, Thomas; and Mine, Kazunori, 4,908,322, Cl. 436-111.000.

National Aeronautics and Space Administration: *See*—
Chao, Tien-Hsin; and Liu, Hua-Kuang, 4,908,702, Cl. 358-93.000.
Hergenrother, Paul M.; and Connell, John W., 4,908,426, Cl. 528-125.000.

Navy: *See*—
DiLemmo, Marc C., 4,908,800, Cl. 367-13.000.
Kersey, Alan D.; Bulmer, Catherine; and Dandridge, Anthony, 4,907,849, Cl. 350-96.140.

U.S. Philips Corporation: *See*—
Bugg, Richard E. F., 4,908,706, Cl. 358-147.000.
Caprarese, Vincent; Chretien, Thierry; and Dauvillier, Richard, 4,908,860, Cl. 380-19.000.
Coops, Peter; and Duijvestijn, Adrianus J., 4,908,506, Cl. 250-201.500.
Kinghorn, John R., 4,908,707, Cl. 358-147.000.
Kuijer, William L.; Van As, Jacobus P. K. M.; and Tjaksel, Frans J., 4,907,998, Cl. 445-9.000.
Ludikhuize, Adrianus W.; van Mil, Job F. P.; and Schoofs, Franciscus A. C. M., 4,908,551, Cl. 315-209.00R.
Perrin, Jean-Claude; and Rollin, Joel, 4,907,867, Cl. 350-429.000.
Raaijmakers, Ivo J. M. M., 4,908,331, Cl. 437-187.000.
Stroomer, Martinus V. C., 4,908,609, Cl. 340-702.000.
Van Liere, Filips, 4,908,578, Cl. 324-309.000.
Woodhead, Alfred W.; Gill, Ronald W. A.; Knapp, Alan G.; Lamport, Daphne L.; and Washington, Derek, 4,908,545, Cl. 313-103.0CM.

United Technologies Corporation: *See*—
Chin, Stephen; and Duhl, David N., 4,908,183, Cl. 420-448.000.
Faiz, Robert L.; Diaz, Nestor J.; and Reinfelder, William C., 4,908,494, Cl. 219-121.720.
Kelch, George W., 4,907,943, Cl. 415-1.000.

Universal Chemical Feeder, Inc.: *See*—
Maglio, Murrili W.; and Moore, Stephen D., 4,908,190, Cl. 422-276.000.

University of California, The Regents of the: *See*—
Kaufman, Leon; Kramer, David M.; and Guzman, Ricardo, 4,908,573, Cl. 324-309.000.
Kramer, George C.; and Holcroft, James W., 4,908,350, Cl. 514-2.000.
Levine, Jon D.; and Basebaum, Allan I., 4,908,387, Cl. 514-653.000.

University of Dayton: *See*—
Salyer, Ival O., 4,908,166, Cl. 264-22.000.

University of Kansas: *See*—
Buller, Clarence S., 4,908,310, Cl. 435-101.000.

University of Maryland, The: *See*—
Snyder, David B., 4,908,305, Cl. 435-5.000.

University of Minnesota, The Regents of the: *See*—
Wood, John M.; and Engle, Francis E., 4,908,317, Cl. 435-262.000.

University of Pennsylvania, Trustees of The: *See*—
Schreiber, Alan D., 4,908,358, Cl. 514-177.000.

UOP: *See*—
Frame, Robert R.; and Bricker, Jeffery C., 4,908,122, Cl. 208-207.000.

Ura, Hiroaki: *See*—
Masuda, Keiji; Nakazawa, Kazuhiro; and Ura, Hiroaki, 4,908,513, Cl. 250-324.000.

Urai, Takahiko, to NEC Corporation. Semiconductor memory device with memory cell arrays and a redundant memory cell array associated with a small number of write-in and sense amplifying circuits. 4,908,798, Cl. 365-230.030.

Urano, Katsuyoshi: *See*—
Noba, Kunihiro; Sakuraba, Yukio; and Urano, Katsuyoshi, 4,907,852, Cl. 350-96.200.

Urban, John A., to Lucas Industries Public Limited Company. Air chamber mounting bracket. 4,907,678, Cl. 188-78.000.

Urech, Karl; and Moser, Roland, to Ciba-Geigy Corporation. Multilayer, heat-curable adhesive film. 4,908,273, Cl. 428-413.000.

Urological Instruments Research, Inc.: *See*—
Borodulin, German; Shkolnik, Alexander; Persidsky, Maxim; and Thuroff, Joachim W., 4,907,572, Cl. 606-128.000.

Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. Apparatus comprising dual reservoirs for parenteral infusion of fluid containing beneficial agent. 4,908,019, Cl. 604-85.000.

US Marine Corporation: *See*—
Jones, David D., 4,907,994, Cl. 440-61.000.

Usami, Jun; and Sasaki, Yuichi, to NGK Insulators, Ltd. Circuit for measuring diffusion-limited current. 4,908,575, Cl. 324-711.000.

Ushioda, Shunta; Tsukuda, Ichizo; Ohneda, Noboru; and Sukimoto, Minobu, to Showa Aluminum Kabushiki Kaisha. Process for producing a chassis for vehicles. 4,907,735, Cl. 228-173.400.

Uytterhoeven, Herman J.: *See*—
Leemans, Luc E.; Uytterhoeven, Herman J.; Teyssie , Philippe J.; Fayt, Roger M.; and de Jaeger, Nikolaas C., 4,908,155, Cl. 252-353.000.

Valente, Ronald R.: *See*—
Borch, Richard F.; and Valente, Ronald R., 4,908,356, Cl. 514-90.000.

Valentine, Michael D.: *See*—
Scholl, Stephen R.; and Valentine, Michael D., 4,908,767, Cl. 364-453.000.

Valentine Research, Inc.: *See*—
Scholl, Stephen R.; and Valentine, Michael D., 4,908,767, Cl. 364-453.000.

Valeo: *See*—
Danieau, Jacques, 4,907,497, Cl. 98-2.080.
Graton, Michel; Courcol, Michel-Andre; and Thiebaut, Jacques, 4,908,004, Cl. 464-68.000.

Valnet Paper Machinery Inc.: *See*—
Mannio, Aaron, 4,907,529, Cl. 118-126.000.

Van Anda, William C. Gameboard activation/deactivation system. 4,907,803, Cl. 273-30.000.

Van Antwerp, Joel C., to Xolox Corporation. Hall-type transducing device. 4,908,527, Cl. 307-309.000.

Van As, Jacobus P. K. M.: *See*—
Kuijer, William L.; Van As, Jacobus P. K. M.; and Traksel, Frans J., 4,907,998, Cl. 445-9.000.

Van der Ploeg, Lex H. T.; Giannini, Suzanne H.; and Cantor, Charles R., to Columbia University in the City of New York, The Trustees of. Method for detecting animal-infective protozoa in vitro and a method for detecting agents which block the differentiation thereof. 4,908,308, Cl. 435-6.000.

Vanderveer, William R.: *See*—
Wood, Robert F.; and Vanderveer, William R., 4,907,426, Cl. 68-200.000.

Van Dest, Jean C.; Guimbretiere, Pierre; Poulain, Bernard; and Verbrugge, Francois, to Glaenzer-Spicer. Axially retained wide flexing angle homokinetic joint. 4,908,005, Cl. 464-111.000.

Vaniglia, Milo M., to Cincinnati Milacron Inc. Fiber placement machine. 4,907,754, Cl. 242-7.210.

Van Liere, Filips, to U.S. Philips Corporation. Method of and device for generating interleaved multiple-slice multiple-echo pulse sequences for MRI. 4,908,578, Cl. 324-309.000.

van Mil, Job F. P.: *See*—
Ludikhuize, Adrianus W.; van Mil, Job F. P.; and Schoofs, Franciscus A. C. M., 4,908,551, Cl. 315-209.00R.

Vara, Fulvio J.: *See*—
Dougherty, James A.; Vara, Fulvio J.; and Anderson, Lowell R., 4,908,227, Cl. 427-44.000.

Varma, Shambhu D. Radio-active method for determining trace amounts of peroxide. 4,908,321, Cl. 436-57.000.

Vasconcellos, Alfred V.; Teodorescu, Ionel E.; Cummings, Joel W.; and McBeth, Dean E., to Pfizer Hospital Products Group, Inc. Surgical instrument for establishing compression anastomosis. 4,907,591, Cl. 606-154.000.

Vasconi, Antonio; and Mazzinghi, Paolo, to Societa Chimica Larderello S.p.A. Boric oxide preparation method. 4,908,196, Cl. 423-278.000.

Vaughan, John E.; and Patry, Bernard, to Schlumberger Electronics (UK) Limited. Commodity metering systems. 4,908,769, Cl. 364-464.040.

Vaughn, Mitchell D., to United States Data Corporation. Industrial control system. 4,908,746, Cl. 364-147.000.

VDO Adolf Schindling AG: *See*—
Treffer, Frank, 4,908,337, Cl. 439-876.000.

Vea, Matthew J. J., to Northern Telecom Limited. Memory organization and output sequencer for a signal processor. 4,908,825, Cl. 370-110.300.

Velino Ventures, Inc.: *See*—
Farrar, David H., 4,908,045, Cl. 44-68.000.

Venkat, Chaya: *See*—
Pruden, Ann L.; Venkat, Chaya; and Whitehurst, Darrell D., 4,908,341, Cl. 502-30.000.

Vent-Plant Corporation, Inc.: *See*—
Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., 4,908,030, Cl. 623-16.000.

Ventura, Susanna: *See*—
Narang, Subhash C.; and Ventura, Susanna, 4,908,442, Cl. 540-145.000.

Venuta, Salvatore: *See*—
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore, 4,908,433, Cl. 530-351.000.
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore, 4,908,434, Cl. 530-417.000.

Vepro GmbH: *See*—
Vetter, Manfred, 4,907,781, Cl. 254-93.0HP.

Verbo, Pedro: *See*—
Gautier, Jean-Pierre; Perez, Miguel; and Verbo, Pedro, 4,907,494, Cl. 91-369.300.

Verbrugge, Francois: *See*—
Van Dest, Jean C.; Guimbretiere, Pierre; Poulain, Bernard; and Verbrugge, Francois, 4,908,005, Cl. 464-111.000.

Vermeulen, Leon L.: *See*—
Vervloet, Ludovicus H.; De Smedt, Willy P.; Vermeulen, Leon L.; and Kok, Piet, 4,908,286, Cl. 430-10.000.

Versage, Corinne. Business oriented greeting cards. 4,907,826, Cl. 283-56.000.

Vervloet, Ludovicus H.; De Smedt, Willy P.; Vermeulen, Leon L.; and Kok, Piet, to Agfa-Gevaert, N.V. Image-receiving material for use in diffusion transfer reversal. 4,908,286, Cl. 430-10.000.

Vetter, Manfred, to Vepro GmbH. Low pressure hoisting air cushion having an airtight chamber with a venting mechanism. 4,907,781, Cl. 254-93.0HP.

Victor Company of Japan, Ltd.: *See*—
Yamaguchi, Tooru, 4,908,614, Cl. 340-723.000.
Victor, Karl-Heinz: *See*—
Heinrich, Juergen; Krauth, Axel; Victor, Karl-Heinz; and Peeken, Heinz, 4,908,081, Cl. 156-89.000.
Videocolor: *See*—
Sbordonne, Arturo, 4,907,999, Cl. 445-66.000.
Vigo, Tyrone L.; Zimmerman, Cynthia M.; Bruno, Joseph S.; and Danna, Gary F., to United States of America, Agriculture. Temperature adaptable textile fibers and method of preparing same. 4,908,238, Cl. 427-389.000.
Villard, Jean-Pierre. Luminous panel for advertising on the ground. 4,907,361, Cl. 40-565.000.
Virtanen, Risto: *See*—
Wetterlin, Kjell I. L.; Virtanen, Risto; and Andersson, Jan A. R., 4,907,583, Cl. 128-203.150.
Visa International Service Association: *See*—
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Niino, Masahiko, 4,908,595, Cl. 337-105.000.

Yamada, Katsutada: *See*—
Omura, Hitoshi; Yamada, Katsutada; and Omura, Hideo, 4,908,280, Cl. 428-679.000.

Yamada, Kazuji: *See*—
Morihara, Atsushi; Naganuma, Yoshio; Koyama, Shuntaro; Yamada, Kazuji; Soga, Tasao; Arakawa, Hideo; Nogita, Shunsuke; and Hishinuma, Yukio, 4,908,695, Cl. 357-81.000.

Yamada, Noboru: *See*—
Nishiuchi, Kenichi; Akahira, Nobuo; Yamada, Noboru; and Ohno, Eiji, 4,908,835, Cl. 374-45.000.

Yamada, Osamu: *See*—
Murooka, Hideyasu; Kyooi, Masayuki; Yamada, Osamu; and Ujiie, Noriaki, 4,908,087, Cl. 156-286.000.

Yamada, Shuji: *See*—
Tsuji, Koji; Yamada, Shuji; and Takegawa, Yoshinobu, 4,908,158, Cl. 252-514.000.

Yamada, Tadatoshi; Iwamoto, Masatami; Ohara, Akinori; Nakamura, Shirou; and Yamamoto, Yuuichi, to Mitsubishi Denki Kabushiki Kaisha. Vacuum chamber for an SOR apparatus. 4,908,580, Cl. 328-235.000.

Yamada, Takeshi: *See*—
Onodera, Tsutomu; and Yamada, Takeshi, 4,908,677, Cl. 356-73.100.

Yamagata, Hirotsugu; Oka, Takafumi; Nozawa, Masafumi; and Kawada, Shinichi, to Hitachi, Ltd. Storage apparatus including a semiconductor memory and a disk drive. 4,908,793, Cl. 365-52.000.

Yamagishi, Takashi: *See*—
Nishii, Junji; Inagawa, Ikuo; Yamagishi, Takashi; Morimoto, Shozo; and Iizuka, Ryuji, 4,908,053, Cl. 65-3.110.

Yamagishi, Tooru, to Victor Company of Japan, Ltd. Image data output apparatus. 4,908,614, Cl. 340-723.000.

Yamaguchi, Akihiro: *See*—
Oikawa, Hideaki; Liyama, Katsuaki; Koga, Nobuhito; Kawashima, Saburo; Tamai, Shoji; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,908,409, Cl. 528-188.000.

Yamaguchi, Takashi, to NEC Corporation. Semiconductor memory device with improved output circuit. 4,908,794, Cl. 365-189.080.

Yamaha Corporation: *See*—
Aoshima, Shinzi; and Narusawa, Sadayuki, 4,908,812, Cl. 369-59.000.
Iijima, Kenzaburou; and Sata, Takeo, 4,908,076, Cl. 148-302.000.
Nagi, Katsuo, 4,908,870, Cl. 381-96.000.
Suzuki, Eiichi; Yokoyama, Kenji; and Noro, Masao, 4,908,752, Cl. 363-17.000.
Suzuki, Hideo; Fujita, Yoshio; and Kuribayashi, Hirotaka, 4,907,484, Cl. 84-661.000.

Yamaji, Hideo: *See*—
Inoue, Kazuo; Yano, Shunji; Yamaji, Hideo; Hirayama, Takayuki; and Hayama, Masato, 4,907,952, Cl. 417-407.000.

Yamaji, Yoshiyuki: *See*—
Ikeura, Hiroo; Yamaji, Yoshiyuki; Murakami, Hajime; Tamaki, Yoshikazu; and Tanaka, Ritsuo, 4,908,667, Cl. 355-256.000.

Yamakawa, Tomoya: *See*—
Inada, Masanori; Suetake, Naruki; Ohtani, Hichiro; and Yamakawa, Tomoya, 4,907,446, Cl. 73-118.200.

Yamamoto, Atsushi; Ienaga, Kazuharu; Higashiura, Kunihiko; and Kurohashi, Masaharu, to Nippon Zoki Pharmaceutical Co., Ltd. Novel dipeptide useful as a plant growth regulator. 4,908,353, Cl. 514-19.000.

Yamamoto, Kanjiro, to Mita Industrial Co., Ltd. Reflecting plate. 4,908,276, Cl. 428-458.000.

Yamamoto, Masaaki, to Minolta Camera Kabushiki Kaisha. Toner image treatment device for use in electrostatic copying machines. 4,908,669, Cl. 355-282.000.

Yamamoto, Masaru, to Omori Machinery Co., Ltd. Automatic packaging method. 4,907,399, Cl. 53-450.000.

Yamamoto, Nobuyoshi; Murata, Yasuhiko; Saeki, Fumimasa; and Kurosaka, Hirosige, to Hitachi Construction Machinery Co., Ltd. Full-turn type working machine. 4,907,667, Cl. 180-89.130.

Yamamoto, Yasuyoshi; Kasamura, Toshirou; Maeda, Yasunori; Sasaki, Nobukazu; Kusumoto, Toshihiko; Okuda, Naoki; Shiratori, Tatsuya; Ozawa, Takashi; Kimura, Akiyoshi; Kubota, Atsushi; Ohashi, Masashi; and Koike, Michiro, to Canon Kabushiki Kaisha. Automatic original feeding apparatus having an image area designating function. 4,908,662, Cl. 355-218.000.

Yamamoto, Yoshihiro: *See*—
Takaki, Usaji; Aoki, Shinobu; Yamamoto, Yoshihiro; and Hara, Isao, 4,908,472, Cl. 560-104.000.

Yamamoto, Yuuichi: *See*—
Yamada, Tadatoshi; Iwamoto, Masatami; Ohara, Akinori; Nakamura, Shirou; and Yamamoto, Yuuichi, 4,908,580, Cl. 328-235.000.

Yamamura, Shigeyuki: *See*—
Hidaka, Norio; Yamamura, Shigeyuki; and Fukuta, Marumi, 4,908,694, Cl. 357-74.000.

Yamamuro, Takahiko; and Fukushima, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Color image display apparatus with color palette before frame memory. 4,908,610, Cl. 340-703.000.

Yamane, Makoto: *See*—
Nagashima, Tsuneo; and Yamane, Makoto, 4,908,050, Cl. 55-400.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Abe, Masami; and Eiki, Hideo, 4,908,443, Cl. 540-221.000.
Ishii, Yoshio; and Yanagisawa, Isao, 4,908,454, Cl. 548-193.000.

Yamashiro, Seiichi: *See*—
Ogawa, Yoshinari; Yamashiro, Seiichi; and Hironaka, Katsuhiko, 4,908,407, Cl. 525-113.000.
Yamashita, Kiyoshi: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,908,560, Cl. 318-603.000.
Yamashita, Takuo: *See*—
Yamaue, Satoshi; Tanaka, Koichi; Nakaya, Hiroaki; Yamashita, Takuo; and Yoshida, Masaru, 4,908,603, Cl. 340-525.000.
Yamashita, Yukinori; Iwata, Kouichi; and Sakagami, Seigou, to Sumitomo Electric Industries, Ltd. Friction brake material with carbon and ferrous portions. 4,907,677, Cl. 188-73.100.
Yamasoe, Katsuyoshi, to Nippon Paint Company, Ltd. Surface treatment chemical for forming a hydrophilic coating. 4,908,075, Cl. 148-256.000.
Yamaue, Satoshi; Tanaka, Koichi; Nakaya, Hiroaki; Yamashita, Takuo; and Yoshida, Masaru. Light emitting alarm board. 4,908,603, Cl. 340-525.000.
Yamazaki, Shoichi: *See*—
Kitagishi, Nozomu; and Yamazaki, Shoichi, 4,907,868, Cl. 350-463.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. FET with a super lattice channel. 4,908,678, Cl. 357-4.000.
Yamazaki, Yukinobu: *See*—
Gotoh, Akira; Yamazaki, Yukinobu; Kikuchi, Naoyuki; Horigome, Shinkichi; Terao, Motoyasu; Suzuki, Hiroyuki; Kitoh, Makoto; Kokaku, Yuichi; and Shimizu, Mitsuru, 4,908,250, Cl. 428-64.000.
Yanagisawa, Isao: *See*—
Ishii, Yoshio; and Yanagisawa, Isao, 4,908,454, Cl. 548-193.000.
Yanagisawa, Masaaki, to Nikon Corporation. Optical system having a variable out-of-focus state. 4,908,639, Cl. 350-431.000.
Yanagitani, Koji: *See*—
Nakagawa, Osamu; Yanagitani, Koji; Sasaki, Ikuo; and Banjo, Toshinobu, 4,908,178, Cl. 264-272.170.
Yang, Chuang Y.: *See*—
Palusamy, Sam S.; Schmertz, John C.; Li, Dali; Chirigos, John N.; Bond, Charles B.; and Yang, Chuang Y., 4,908,775, Cl. 364-508.000.
Yang, Y. C.; and Chow, Philip Y., to T. Y. Lin International. Bridge and method of installing prefabricated bridges and bridge structure. 4,907,312, Cl. 14-21.000.
Yannotti, Julian J.; and Johnson, Thomas. Anti-pickpocket alarm. 4,908,607, Cl. 340-571.000.
Yano, Hideaki: *See*—
Hara, Hiroshi; Sonobe, Hiraku; Shihou, Makoto; Koyama, Osamu; Tateoka, Masamichi; Ida, Koichi; and Yano, Hideaki, 4,907,858, Cl. 350-286.000.
Yano, Shunji: *See*—
Inoue, Kazuo; Yano, Shunji; Yamaji, Hideo; Hirayama, Takayuki; and Hayama, Masato, 4,907,952, Cl. 417-407.000.
Yasuda, Kazuo: *See*—
Nakazone, Takayoshi; and Yasuda, Kazuo, 4,907,854, Cl. 350-96.230.
Yasuda, Mamoru, to Tohoku Diving Center Co. Ltd. Improved diving wet suit. 4,907,295, Cl. 2-2.10R.
Yasushi, Miyoshi: *See*—
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.
Yazaki Corporation: *See*—
Iino, Tadashi, 4,908,611, Cl. 340-705.000.
Ueda, Shinichi; Obtaka, Michihiro; Nakayama, Yoshiaki; Shinba, Hiroaki; and Ichikawa, Hiroshi, 4,907,836, Cl. 276-39.100.
Yazawa, Toshikuni: *See*—
Shoda, Isao; Fujinawa, Takeshi; and Yazawa, Toshikuni, 4,907,371, Cl. 51-33.00R.
Yeager, Donald A. Insect diverter for automotive vehicle windshield. 4,907,837, Cl. 296-91.000.
Yim, Nelson C. F.: *See*—
Callahan, James F.; Huffman, William F.; Newlander, Kenneth A.; and Yim, Nelson C. F., 4,908,475, Cl. 560-115.000.
Yip, Yum K., to New York University. Novel polypeptide having gamma-interferon activity. 4,908,432, Cl. 530-351.000.
Yockey, Steve J.: *See*—
Gardner, Robert C.; Giachino, Joseph M.; Horn, William F.; Rhoades, Mark K.; Wells, Marvin D.; and Yockey, Steve J., 4,907,748, Cl. 239-584.000.
Yoder, Lois. Process for debittering soybean grit. 4,908,224, Cl. 426-634.000.
Yokogawa, Fumihiko; and Hirano, Hiroyuki, to Pioneer Electronic Corporation. Method and apparatus for data recording and reproducing with error reduction. 4,908,811, Cl. 369-54.000.
Yokono, Hitoshi: *See*—
Ishihara, Shousaku; Yokono, Hitoshi; Fujita, Tsuyoshi; Satoh, Ryohei; and Wasai, Kiyotaka, 4,908,696, Cl. 357-81.000.
Yokota, Ichiro: *See*—
Abe, Morio; and Yokota, Ichiro, 4,907,709, Cl. 215-252.000.
Yokoyama, Kenji: *See*—
Suzuki, Eiichi; Yokoyama, Kenji; and Noro, Masao, 4,908,752, Cl. 363-17.000.
Yokoyama, Shoichi: *See*—
Aoyagi, Osamu; Yokoyama, Shoichi; Kaneko, Hirotada; Nakatsuno, Eiji; and Ito, Shotaro, 4,907,646, Cl. 165-151.000.
Yokoyama, Tsuneo: *See*—
Tamada, Kazukiyo; Takatori, Naoki; Yokoyama, Tsuneo; Mikajiri, Satoshi; Kubota, Mineo; and Saito, Hiroshi, 4,908,643, Cl. 354-400.000.
Yokoyama, Yoshimitsu, to Milliken Research Corporation. Corner-forming unit of a carton container-forming machine. 4,908,009, Cl. 493-178.000.
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, to Sumitomo Chemical Company, Limited. Method for producing an optically active azolyl-α β-unsaturated alcohol. 4,908,455, Cl. 548-268.400.
Yonezawa, Kazuya: *See*—
Deguchi, Yoshikuni; Iwarkiri, Hiroshi; Iwamoto, Kazunari; and Yonezawa, Kazuya, 4,908,459, Cl. 549-215.000.
Yoo, Eddie B. Wallet-organizer. 4,907,634, Cl. 150-135.000.
Yopp, W. Trent, to Ford Motor Company. System for detecting rotational imbalance of vehicle roadwheels. 4,907,452, Cl. 73-457.000.
Yorimoto, Yoshikazu: *See*—
Matsumura, Hidekazu; and Yorimoto, Yoshikazu, 4,908,038, Cl. 902-5.000.
Yoshida, Masaru: *See*—
Yamaue, Satoshi; Tanaka, Koichi; Nakaya, Hiroaki; Yamashita, Takuo; and Yoshida, Masaru, 4,908,603, Cl. 340-525.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Buried type semiconductor laser device. 4,908,830, Cl. 372-46.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Buried type semiconductor laser device. 4,908,831, Cl. 372-46.000.
Yoshida, Yasunobu; and Karasawa, Kazumitsu, to Yoshida, Yasunobu. Spherical cyclone. 4,908,049, Cl. 55-227.000.
Yoshigae, Takeo: *See*—
Hikosaka, Akihide; Mimura, Tsuyoshi; Suzuki, Tomio; Yoshigae, Takeo; and Ito, Shuzo, 4,908,059, Cl. 75-43.000.
Yoshinaga, Yoko: *See*—
Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,908,285, Cl. 430-1.000.
Yoshio, Kato: *See*—
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.
Yoshioka, Isamu, to Toppan Moore Co., Ltd. Apparatus for folding and cutting paper. 4,908,010, Cl. 493-357.000.
Yoshioka, Takeo; Kobayashi, Masahiro; Minagawa, Tadao; and Ujita, Katsu, to Mitsubishi Denki Kabushiki Kaisha. Lightning arrester monitor. 4,908,729, Cl. 361-118.000.
Yoshitake, Kunitoshi: *See*—
Murakami, Takashi; and Yoshitake, Kunitoshi, 4,908,737, Cl. 361-419.000.
Young, Keith A.: *See*—
Bark, Jeffrey E.; and Young, Keith A., 4,908,029, Cl. 623-8.000.
Young, Robert J., Jr.: *See*—
Bolt, John D.; Mahler, Walter; Tebbe, Frederick N.; and Young, Robert J., Jr., 4,908,197, Cl. 423-412.000.
Yu, Dong. Microwave brewing apparatus and method. 4,908,222, Cl. 426-241.000.
Yuen, Frank. Syringe assembly. 4,908,023, Cl. 604-118.000.
Yukawa, Takahiro: *See*—
Toyama, Takashi; Ohzeki, Minoru; and Yukawa, Takahiro, 4,908,547, Cl. 313-471.000.
Yukio, Uchida: *See*—
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, 4,908,279, Cl. 428-659.000.
Yum, Su I.: *See*—
Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 4,908,027, Cl. 604-890.100.
Yumoto, Tetsuo, to Sankyo Kasei Kabushiki Kaisha. Molded article with partial metal plating and a process for producing such article. 4,908,259, Cl. 428-209.000.
Yung, Michael W., to United States of America, Air Force. Cut-only CMOS switch for discretionary connect and disconnect. 4,908,525, Cl. 307-202.100.
Yusuke, Hirose; Yukio, Uchida; Yoshio, Kato; Kazuyuki, Hisada; Koichi, Watanabe; Nobuhiko, Sakai; and Yasushi, Miyoshi, to Nisshin Steel Co., Ltd. Multilayer electroplated steel sheet. 4,908,279, Cl. 428-659.000.
Yyzkumny Ustav Bavlnarsky: *See*—
Burysek, Frantisek; and Hortlik, Frantisek, 4,907,755, Cl. 242-35.50A.
Zachrei, Jurgen; and Debus, Jurgen, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Switch box for wall attachment. 4,908,733, Cl. 361-356.000.
Zadoks, Abraham L.: *See*—
Bailey, John M.; and Zadoks, Abraham L., 4,907,565, Cl. 123-23.000.
Zag, Heinz; Meinecke, Albrecht; Kolb, Otmar; Mullner, Josef; Csordas, Elemer; and Egelhof, Dieter, to J. M. Voith GmbH. Device for continuously dewatering a fiber web. 4,908,102, Cl. 162-264.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Breisch, Harald, 4,907,684, Cl. 192-106.00F.
Zakowski, Jack J.; Cuomo, Vincent A.; Blanke, Gordon C.; and Meyer, Richard C., to Beckman Instruments, Inc. Analyzer operating method. 4,908,320, Cl. 436-45.000.
Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., to Board of Trustees at the Leland Stanford Junior University, The.

Capillary electrophoretic device employing structure permitting electrical contact through ionic movement. 4,908,116, Cl. 204-299.00R.

Zeblisky, Rudolph J.: *See*—
Hughes, Rowan; Paunovic, Milan; and Zeblisky, Rudolph J., 4,908,242, Cl. 427-443.100.

Zecher, Wilfried; Arlt, Dieter; and Sayed, Aziz E., to Bayer Aktiengesellschaft. Special polyimides as thermoplasts. 4,908,429, Cl. 528-353.000.

Zecher, Wilfried; Arlt, Dieter; Schrader, Lutz; and Waldenrath, Werner, to Bayer Aktiengesellschaft. Use of special polyimides as cast films and coatings. 4,908,430, Cl. 528-353.000.

Zeidler, Peter: *See*—
Walde, Michael; Zeidler, Peter; and Domroese, Dirk, 4,907,526, Cl. 118-50.000.

Zeiler, Hans-Joachim: *See*—
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 4,908,366, Cl. 514-252.000.

Zerr, Jeffrey R.: *See*—
Baker, Timothy J.; Woods, John H.; and Zerr, Jeffrey R., 4,908,063, Cl. 106-31.000.

Zhang, Changgong: *See*—
Jiang, Xicheng; Zhang, Changgong; Gao, Yizhi; and Deng, Shiqiao, 4,908,490, Cl. 219-50.000.

Zielke, Henry: *See*—
Shah, Hasmukh; Zielke, Henry; Patterson, Richard L.; and Pellegrino, Thomas P., 4,907,324, Cl. 29-33.00M.

Zimmerman, Cynthia M.: *See*—
Vigo, Tyrone L.; Zimmerman, Cynthia M.; Bruno, Joseph S.; and Danna, Gary F., 4,908,238, Cl. 427-389.000.

Zinser Textilmaschinen GmbH: *See*—
Gubler, Hans R.; and Fetzer, Gustav, 4,908,534, Cl. 310-45.000.

Zolotarsky, Ilya A.: *See*—
Matros, Jury S.; and Zolotarsky, Ilya A., 4,908,390, Cl. 518-706.000.

Zombeck, Alan: *See*—
Bausch, Gregory G.; Seelbach, Elizabeth A.; and Zombeck, Alan, 4,908,140, Cl. 252-8.600.

Zucholl, Klaus: *See*—
Ammende, Sonya; Erdmann, Hartmut; Etzkorn, Heinz-Werner; and Zucholl, Klaus, 4,908,118, Cl. 204-424.000.

Zuhr, Raymond A.; and Holland, Orin W., to United States of America, Energy. Method for forming metallic silicide films on silicon substrates by ion beam deposition. 4,908,334, Cl. 437-200.000.

Zupancic, Joseph J., to Allied-Signal Inc. Photodefinable interlevel dielectrics. 4,908,096, Cl. 156-655.000.

Zwadlo, Gregory L.: *See*—
Mikelsons, Valdis; Lucking, Lawrence M.; and Zwadlo, Gregory L., 4,907,532, Cl. 118-659.000.

Zweymuller, Karl: *See*—
Deckner, Andre G.; Imhof, Martin; and Zweymuller, Karl, 4,908,035, Cl. 623-23.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MARCH, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ahlberg, Russell W. Protective bar assembly for motorcycle. Re. 33,178, Cl. 280-304.300.

Davis, William R.; and Hart, David G., to Fairchild Weston Systems, Inc. Light weight chassis and cabinet assembly for magnetic tape recorder. Re. 33,180, Cl. 360-137.000.

Fairchild Weston Systems, Inc.: *See*—
Davis, William R.; and Hart, David G., Re. 33,180, Cl. 360-137.000.

Hart, David G.: *See*—
Davis, William R.; and Hart, David G., Re. 33,180, Cl. 360-137.000.

Hashimoto, Toyokazu: *See*—
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, Re. 33,181, Cl. 364-900.000.

Hitachi, Ltd.: *See*—
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, Re. 33,181, Cl. 364-900.000.

Kida, Masahiko: *See*—
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, Re. 33,181, Cl. 364-900.000.

Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, to Hitachi, Ltd. Data transmission system adapted to facilitate detection of safe receipt of a transmitted data frame by a receiving station. Re. 33,181, Cl. 364-900.000.

Pettibone, Craig R., to Specialty Products, Inc. Toe adjustment apparatus. Re. 33,179, Cl. 280-661.000.

Specialty Products, Inc.: *See*—
Pettibone, Craig R., Re. 33,179, Cl. 280-661.000.

Wada, Hiroyuki: *See*—
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, Re. 33,181, Cl. 364-900.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Cosan Chemical Corporation: *See*—
Leckart, Arthur R.; and Hansen, H. Victor, B1 4,584,362, Cl. 528-55.000.

Coster, A. Arthur: *See*—
Fox, Kenneth R.; and Coster, A. Arthur, B1 4,784,132, Cl. 606-15.000.

Dambre, Paul, to N.V. Bekaert S.A. Layered steel cord. B1 4,651,513, 3-13-90, Cl. 57-217.000.

Durand-Raute Industries, Ltd.: *See*—
Hards, John E., B1 3,808,925, Cl. 83-346.000.

Fox, Kenneth R.; and Coster, A. Arthur. Method of and apparatus for laser treatment of body lumens. B1 4,784,132, 3-13-90, Cl. 606-15.000.

Garrett, Clyde B.; and Thayer, William S., to Koppers Co., Inc. Method and apparatus for accurate die-cutting. B1 3,882,745, 3-13-90, Cl. 83-311.000.

Hansen, H. Victor: *See*—
Leckart, Arthur R.; and Hansen, H. Victor, B1 4,584,362, Cl. 528-55.000.

Hards, John E., to Durand-Raute Industries, Ltd. Rotary veneer clipper. B1 3,808,925, 3-13-90, Cl. 83-346.000.

Hattori, Yoshinori; Kawamura, Mitsuyoshi; and Matsuo, Yasushi, to NGK Spark Plug Co., Ltd. Process for producing high density sintered products. B1 4,248,813, 3-13-90, Cl. 264-62.000.

Kawamura, Mitsuyoshi: *See*—
Hattori, Yoshinori; Kawamura, Mitsuyoshi; and Matsuo, Yasushi, B1 4,248,813, Cl. 264-62.000.

Koppers Co., Inc.: *See*—
Garrett, Clyde B.; and Thayer, William S., B1 3,882,745, Cl. 83-311.000.

Leckart, Arthur R.; and Hansen, H. Victor, to Cosan Chemical Corporation. Bismuth catalyst system for preparing polyurethane elastomers. B1 4,584,362, 3-13-90, Cl. 528-55.000.

Matsuo, Yasushi: *See*—
Hattori, Yoshinori; Kawamura, Mitsuyoshi; and Matsuo, Yasushi, B1 4,248,813, Cl. 264-62.000.

NGK Spark Plug Co., Ltd.: *See*—
Hattori, Yoshinori; Kawamura, Mitsuyoshi; and Matsuo, Yasushi, B1 4,248,813, Cl. 264-62.000.

N.V. Bekaert S.A.: *See*—
Dambre, Paul, B1 4,651,513, Cl. 57-217.000.

Thayer, William S.: *See*—
Garrett, Clyde B.; and Thayer, William S., B1 3,882,745, Cl. 83-311.000.

LIST OF DESIGN PATENTEES

Aguilar, John J.; and Lucht, Orren. Towed watercraft. 306,631, 3-13-90, Cl. D21-228.000.

Alcatel Standard Electrica S.A.: *See*—
Vallejo, Vincente D., 306,586, Cl. D14-149.000.

American Telephone and Telegraph Company: *See*—
Hiatt, Jeffrey M.; Johnson, Chris G.; Martin, William H., Jr.; Millman, Mark E.; and Wink, Timothy P., 306,576, Cl. D13-40.000.

Anderson, Darryl L. Holder for beverage container. 306,544, 3-13-90, Cl. D7-620.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone. 306,587, 3-13-90, Cl. D14-151.000.

Andy, Ralph B. Egg carton. 306,556, 3-13-90, Cl. D9-341.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Yamanaka, Toshimasa; Shishikura, Takenao; and Takahashi, Akio, 306,606, Cl. D16-133.000.

ASEA Aktiebolag: *See*—
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Astley, Graham J.: *See*—
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Avia Group International, Inc.: *See*—
Backus, Peter P., 306,514, Cl. D2-314.000.

Backus, Peter P., to Avia Group International, Inc. Shoe upper. 306,514, 3-13-90, Cl. D2-314.000.

Bacon, David L.; and Crawford, Catharine P. Multi-purpose lectern. 306,534, 3-13-90, Cl. D6-419.000.

Bang & Olufsen of America, Inc.: *See—*
Hansson, Keld, 306,592, Cl. D14-214.000.

Barish, Robert A.; and Searby, Frederick G., to Carter-Wallace, Inc. Package for cosmetics. 306,562, 3-13-90, Cl. D9-424.000.

Barnes, Edna L., to Barnes, Edna L. Toy bear figure. 306,624, 3-13-90, Cl. D21-159.000.

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Belanger, Inc.: *See—*
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Belanger, James A.; Wentworth, Robert J.; Astley, Graham J.; and Turner, Barry S., to Belanger, Inc. Nozzle for vehicle air drying apparatus. 306,602, 3-13-90, Cl. D15-144.100.

Blance, Andrew J.: *See—*
Weisz, Sandor F.; and Blance, Andrew J., 306,591, Cl. D14-168.000.

Blick, John S., III. Windmill hub. 306,595, 3-13-90, Cl. D15-1.000.

Bogey-Buster, Inc.: *See—*
Gouin, Ronald P., 306,632, Cl. D21-234.000.

BP Co. p.l.c.: *See—*
Wills, Anthony J., 306,639, Cl. D23-205.000.

Brevetti Gaggia, S.p.A.: *See—*
Pandolfi, Alberto, 306,536, Cl. D6-468.000.

Brundisini, Andrea, to James Hardie Irrigation, Inc. Display panel for an irrigation controller. 306,575, 3-13-90, Cl. D13-35.000.

Busch Creative Services Corporation: *See—*
Kodner, Gary A.; and Froeschner, Kenneth D., 306,614, Cl. D20-42.000.

Buxbaum, William C.: *See—*
Lapicola, James D.; and Buxbaum, William C., 306,649, Cl. D24-56.000.

Carrier Corporation: *See—*
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Carter-Wallace, Inc.: *See—*
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Casio Computer Co., Ltd.: *See—*
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Cavalier, Serge A., to Safare-Crouzet. Shipboard operations terminal used with digitized voice control-machine and communication system. 306,584, 3-13-90, Cl. D14-147.000.

Cavalier, Serge A., to Safare-Crouzet. Shipboard operations terminal used with digitized voice control machine and communication systems. 306,585, 3-13-90, Cl. D14-147.000.

CH Products: *See—*
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Chang, Dick Y. K.; Eisberg, Keith V.; and Wichmann, Curtis D., to Carrier Corporation. Housing for an outdoor coil of an air conditioning system. 306,642, 3-13-90, Cl. D23-351.000.

Chang, Kun H. Shoe pad. 306,515, 3-13-90, Cl. D2-318.000.

Cluff, Robert E. Cylindrical necktie. 306,518, 3-13-90, Cl. D2-605.000.

Cooperative Marketing Co., The: *See—*
Krautsack, Richard G., 306,541, Cl. D6-515.000.

Cotton, George O. Rehabilitation therapy board. 306,646, 3-13-90, Cl. D24-36.000.

Cox, Daniel. Gun grip. 306,634, 3-13-90, Cl. D22-104.000.

Cox, Daniel. Gun grip. 306,635, 3-13-90, Cl. D22-104.000.

Cox, Daniel. Gun grip. 306,636, 3-13-90, Cl. D22-104.000.

Coy, James R. Combined insulated beverage holder and pouch. 306,546, 3-13-90, Cl. D7-605.000.

Crawford, Catharine P.: *See—*
Bacon, David L.; and Crawford, Catharine P., 306,534, Cl. D6-419.000.

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Croy, Phyllis A. Jewelry holder. 306,542, 3-13-90, Cl. D6-553.000.

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Hills, Brian; Graham, Dennis J.; and Cutler, Burton, 306,611, Cl. D19-64.000.

Davis, Steven D.: *See—*
Lane, William A.; and Davis, Steven D., 306,555, Cl. D9-305.000.

Decor Corporation Proprietary Limited, The: *See—*
Wolfenden, Anthony H., 306,547, Cl. D7-317.000.

Deere & Company: *See—*
Swartzendruber, James A.; Thompson, Warren L.; and Peck, Donald R., 306,598, Cl. D15-11.000.

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Dinte, Michael L.; and Dinte, Anthony J., to J.A. Dinte Pty. Limited. Golf putter head. 306,630, 3-13-90, Cl. D21-219.000.

Doi, Takayoshi, to Takara Co., Ltd. Toy humanoid robot assembly. 306,618, 3-13-90, Cl. D21-150.000.

Doi, Takayoshi, to Takara Co., Ltd. Reconfigurable toy cassette. 306,619, 3-13-90, Cl. D21-150.000.

Doi, Takayoshi, to Takara Co., Ltd. Reconfigurable toy cassette. 306,620, 3-13-90, Cl. D21-150.000.

Doi, Takayoshi, to Takara Co., Ltd. Reconfigurable toy cassette. 306,621, 3-13-90, Cl. D21-150.000.

Doi, Takayoshi, to Takara Co., Ltd. Toy humanoid robot assembly. 306,622, 3-13-90, Cl. D21-150.000.

Doi, Takayoshi, to Takara Co., Ltd. Reconfigurable toy cassette. 306,623, 3-13-90, Cl. D21-150.000.

Drits, Vladimir; and Reshanov, Eugene N., to Innovex Inc. Pulse generating machine for use in treating tools. 306,600, 3-13-90, Cl. D15-122.000.

Durand, Jean-Jacques. Perfume bottle. 306,560, 3-13-90, Cl. D9-384.000.

E and L Plus, Inc.: *See—*
Worley, Glenn E., 306,528, Cl. D6-309.000.

Educational Insights, Inc.: *See—*
Hills, Brian; Graham, Dennis J.; and Cutler, Burton, 306,611, Cl. D19-64.000.

Eisberg, Keith V.: *See—*
Chang, Dick Y. K.; Eisberg, Keith V.; and Wichmann, Curtis D., 306,642, Cl. D23-351.000.

Eldon Industries, Inc.: *See—*
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Elsmore, Jeff C.; Haager, James A.; Scheibenreif, John A.; and Strickett, Francis, to IDEA Courier Incorporated. Computer terminal. 306,580, 3-13-90, Cl. D14-113.000.

English Glass Company Limited, The: *See—*
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Pawlik, James P.; and Erdall, Margaret A., 306,565, Cl. D10-118.000.

Evenson, Mei, to Eldon Industries, Inc. Foldable lectern. 306,535, 3-13-90, Cl. D6-419.000.

Fardig, Hakan: *See—*
Forss, Torbjorn; Fardig, Hakan; and Svensson, Tommy, 306,603, Cl. D15-199.000.

Fiust, Gwendolyn A. Stuffed toy figure. 306,625, 3-13-90, Cl. D21-171.000.

Forss, Torbjorn; Fardig, Hakan; and Svensson, Tommy, to ASEA Aktiebolag. Welding seam tracker. 306,603, 3-13-90, Cl. D15-199.000.

Fox, Jim. Revolving golf tee. 306,627, 3-13-90, Cl. D21-208.000.

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Krolopp, Rudolph W.; Larsen, Duke; and Freeburg, Thomas A., 306,583, Cl. D14-137.000.

Fritsch, Barry R. Coat rack. 306,533, 3-13-90, Cl. D6-412.000.

Froeschner, Kenneth D.: *See—*
Kodner, Gary A.; and Froeschner, Kenneth D., 306,614, Cl. D20-42.000.

Geared for Travel Limited: *See—*
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Gencsco Inc.: *See—*
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Whatley, Ian H., 306,517, Cl. D2-320.000.

Goldstar Co., Ltd.: *See—*
Ham, Young H., 306,590, Cl. D14-165.000.

Goldstein, Matthias M. Bottle holder. 306,564, 3-13-90, Cl. D09-455.000.

Goodell, John L. Photograph or document holder. 306,529, 3-13-90, Cl. D6-310.000.

Gouin, Ronald P., to Bogey-Buster, Inc. Golfing practice device. 306,632, 3-13-90, Cl. D21-234.000.

Graham, Dennis J.: *See—*
Hills, Brian; Graham, Dennis J.; and Cutler, Burton, 306,611, Cl. D19-64.000.

Great Plains Industries, Inc.: *See—*
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Greaves, Henry: *See—*
Manoy, Russell; and Greaves, Henry, 306,605, Cl. D16-130.000.

Greyling, Thomas F.; Steenkamp, Jan H.; and Taute, Matthias G. Advertising display stand. 306,532, 3-13-90, Cl. D6-396.000.

Haager, James A.: *See—*
Elsmore, Jeff C.; Haager, James A.; Scheibenreif, John A.; and Strickett, Francis, 306,580, Cl. D14-113.000.

Ham, Young H., to Goldstar Co., Ltd. Cassette tape recorder. 306,590, 3-13-90, Cl. D14-165.000.

Hansson, Keld, to Bang & Olufsen of America, Inc. In-wall loudspeaker. 306,592, 3-13-90, Cl. D14-214.000.

Hara, Kunio; and Tani, Atsushi, to Kabushiki Kaisha Toshiba. Optical disk unit for electronic computers. 306,579, 3-13-90, Cl. D14-109.000.

Hayes, Charles L., to CH Products. Joystick. 306,615, 3-13-90, Cl. D21-48.000.

Hematronix, Inc.: *See—*
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Henderson, Johnie A., to Multimethods, Inc. Rodent bait station. 306,637, 3-13-90, Cl. D22-119.000.

Herpel, Donald R. Bumper spoiler. 306,572, 3-13-90, Cl. D12-181.000.

Hiatt, Jeffrey M.; Johnson, Chris G.; Martin, William H., Jr.; Millman, Mark E.; and Wink, Timothy P., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Circuit module housing. 306,576, 3-13-90, Cl. D13-40.000.

Hills, Brian; Graham, Dennis J.; and Cutler, Burton, to Educational Insights, Inc. Teaching clock. 306,611, 3-13-90, Cl. D19-64.000.

Hitachi, Ltd.: *See—*
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Hodgson, William D.: *See—*
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Mergenov, George, 306,539, Cl. D6-477.000.
Mergenov, George, 306,540, Cl. D6-477.000.
Hunter, Joseph R. Grapple with replacement tip therefor. 306,599, 3-13-90, Cl. D15-32.000.
IDEA Courier Incorporated: *See—*
Elsmore, Jeff C.; Haager, James A.; Scheibenreif, John A.; and Strickett, Francis, 306,580, Cl. D14-113.000.
Inax Corporation: *See—*
Ono, Nobuhiro; and Okada, Hideaki, 306,593, Cl. D14-231.000.
Inman, Michael J. Pocket knife. 306,550, 3-13-90, Cl. D8-99.000.
Innovex Inc.: *See—*
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Ishikawa, Sumie; Yokoi, Kenji; and Sumita, Mamoru, to Hitachi, Ltd. Optical disk drive unit for electronic computer. 306,578, 3-13-90, Cl. D14-109.000.
J.A. Dinte Pty. Limited: *See—*
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Janome Sewing Machine Co., Ltd.: *See—*
Uchida, Koji, 306,601, Cl. D15-69.000.
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Hiatt, Jeffrey M.; Johnson, Chris G.; Martin, William H., Jr.; Millman, Mark E.; and Wink, Timothy P., 306,576, Cl. D13-40.000.
Johnson, Robert C., to Procter & Gamble Company, The. Applicator for antiperspirant. 306,563, 3-13-90, Cl. D9-434.000.
Jones, George H. Sports jacket. 306,511, 3-13-90, Cl. D2-191.000.
Jones, Robert D.; and Wilkes, Lori D. Specimen cup holder. 306,648, 3-13-90, Cl. D24-54.000.
JWI, Inc.: *See—*
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Kabushiki Kaisha Sato: *See—*
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Matsutani, Kinya; and Ohguma, Hirotsugu, 306,577, Cl. D13-99.000.
Kahler, William F., to Tek-Aids, Inc. Dispenser for chemically-coded strips used in medical treatment. 306,612, 3-13-90, Cl. D19-67.000.
Kashiwaba, Tadao: *See—*
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Kashiwagi, Ryoh, to Sony Corporation. Combined tape recorder and radio receiver. 306,588, 3-13-90, Cl. D14-163.000.
Kautz, Christopher L., to U.S. Philips Corporation. Television receiver. 306,581, 3-13-90, Cl. D14-126.000.
Kellogg Plastics, Ltd.: *See—*
Rumpel, Donald D., 306,553, Cl. D8-395.000.
Kelly, J. Joseph, III. Brush block. 306,527, 3-13-90, Cl. D4-138.000.
Kenney, Dean. Belt clip holder. 306,521, 3-13-90, Cl. D3-100.000.
Kodner, Gary A.; and Froeschner, Kenneth D., to Busch Creative Services Corporation. Display holder for attachment to boules or similar articles. 306,614, 3-13-90, Cl. D20-42.000.
Kohler Co.: *See—*
Kohler, Herbert V., Jr, Herbert V.; and Reid, Mary J., 306,641, Cl. D23-311.000.
Kohler, Herbert V., Jr, Herbert V.; and Reid, Mary J., to Kohler Co. Toilet seat. 306,641, 3-13-90, Cl. D23-311.000.
Koppens, Leonardus, deceased; and Maarschalkerweerd, Han, executor, to Schlumberger Industries, Inc. Point-of-sale terminal. 306,609, 3-13-90, Cl. D18-4.000.
Kott, Aaron D., to Pleatco Electronic & Filter Corp. Liquid filter cartridge for swimming pools or the like. 306,640, 3-13-90, Cl. D23-209.000.
Krautsack, Richard G., to Cooperative Marketing Co., The. Pivotable display holder and dispenser for sheet material. 306,541, 3-13-90, Cl. D6-515.000.
Krolopp, Rudolph W.; Larsen, Duke; and Freeburg, Thomas A., to Motorola, Inc. Radio transceiver housing or similar article. 306,583, 3-13-90, Cl. D14-137.000.
Lane, William A.; and Davis, Steven D., to W. A. Lane, Inc. Pouch. 306,555, 3-13-90, Cl. D9-305.000.
Lapicola, James D.; and Buxbaum, William C., to Hematronix, Inc. Blood collection vial. 306,649, 3-13-90, Cl. D24-56.000.
Larsen, Duke: *See—*
Krolopp, Rudolph W.; Larsen, Duke; and Freeburg, Thomas A., 306,583, Cl. D14-137.000.
Lawson, Thomas J., to English Glass Company Limited, The. Dispenser. 306,554, 3-13-90, Cl. D9-300.000.
Lee, Noel. Clam shell package with wings. 306,561, 3-13-90, Cl. D9-415.000.
Lemmey, Edgar S. Close-up camera. 306,607, 3-13-90, Cl. D16-209.000.
Leonard Parfums: *See—*
Leonard, Philippe, 306,559, Cl. D9-384.000.
Leonard, Philippe, to Leonard Parfums. Combined bottle and closure. 306,559, 3-13-90, Cl. D9-384.000.
Lerch, Karl D., to Quaker Oats Company, The. Fishing pole. 306,638, 3-13-90, Cl. D22-137.000.
Libman Broom Company: *See—*
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Saunders, Jolyon, 306,526, Cl. D4-138.000.
Lo, Kun-Nan. Tennis racket. 306,628, 3-13-90, Cl. D21-212.000.
Lomonaco, Steve, to Wildfire, Inc. Vehicle top. 306,570, 3-13-90, Cl. D12-156.000.
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Luthy, Chella, to Creative Environments, Inc. Electric fragrance dispenser for insertion in an automobile cigarette lighter socket. 306,644, 3-13-90, Cl. D23-366.000.
Maarschalkerweerd, Han, executor: *See—*
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Maddock, Robert E. Offset pump housing. 306,596, 3-13-90, Cl. D15-7.000.
Males, Howard E.: *See—*
Sachs, Michael A.; and Males, Howard E., 306,513, Cl. D2-310.000.
Manoy, Russell; and Greaves, Henry. Borescope. 306,605, 3-13-90, Cl. D16-130.000.
Marshall, Rosemary. Hand held roller. 306,524, 3-13-90, Cl. D4-122.000.
Martin, William H., Jr.: *See—*
Hiatt, Jeffrey M.; Johnson, Chris G.; Martin, William H., Jr.; Millman, Mark E.; and Wink, Timothy P., 306,576, Cl. D13-40.000.
Matsutani, Kinya; and Ohguma, Hirotsugu, to Kabushiki Kaisha Toshiba. Superconducting magnet for magnetic resonance imaging apparatuses. 306,577, 3-13-90, Cl. D13-99.000.
McCarthy, Patricia. Wheel chair attachment container or similar article. 306,520, 3-13-90, Cl. D3-40.000.
McMurtrey, David K., to Wald Manufacturing Co., Inc. Leg for a bicycle kickstand. 306,568, 3-13-90, Cl. D12-120.000.
Medical Product Designs, Inc.: *See—*
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Mergenov, George, to Hu, Lune-Ching. Table. 306,538, 3-13-90, Cl. D6-477.000.
Mergenov, George, to Hu, Lune-Ching. Table. 306,539, 3-13-90, Cl. D6-477.000.
Mergenov, George, to Hu, Lune-Ching. Table. 306,540, 3-13-90, Cl. D6-477.000.
Mezey, John J.; and Young, Michael, to Robeson Industries Corporation. Can opener. 306,548, 3-13-90, Cl. D8-36.000.
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Miyahara, Akihiro; and Nakatsuka, Hiroshi, to Casio Computer Co., Ltd. Portable television set. 306,582, 3-13-90, Cl. D14-126.000.
Monigle, Martha. Toy figure. 306,617, 3-13-90, Cl. D21-148.000.
Mosley, Peggy: *See—*
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Motorola, Inc.: *See—*
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Taylor, Terrance N., 306,594, Cl. D14-253.000.
Mount, Floyd E. Combined wind deflector and roof storage container. 306,571, 3-13-90, Cl. D12-181.000.
Mraz, Rene: *See—*
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Multimethods, Inc.: *See—*
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Murayama, Noboru, to Plus Corporation. Tape recorder. 306,589, 3-13-90, Cl. D14-165.000.
Nakata, Toshiaki, to Plus Corporation. Writing case. 306,519, 3-13-90, Cl. D3-74.000.
Nakatsuka, Hiroshi: *See—*
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Natali, Gordon J.; and Natali, Susan D. Combined brush and mirror. 306,523, 3-13-90, Cl. D4-116.000.
Natali, Susan D.: *See—*
Natali, Gordon J.; and Natali, Susan D., 306,523, Cl. D4-116.000.
Null, Cecil A. Eye wear or similar article. 306,604, 3-13-90, Cl. D16-104.000.
Ohguma, Hirotsugu: *See—*
Matsutani, Kinya; and Ohguma, Hirotsugu, 306,577, Cl. D13-99.000.
Ohno, Kouzin, to Takara Co., Ltd. Toy jet-plane. 306,616, 3-13-90, Cl. D21-87.000.
Okada, Hideaki: *See—*
Ono, Nobuhiro; and Okada, Hideaki, 306,593, Cl. D14-231.000.
Ono, Nobuhiro; and Okada, Hideaki, to Inax Corporation. Feed horn. 306,593, 3-13-90, Cl. D14-231.000.
Pandolfi, Alberto, to Brevetti Gaggia, S.p.A. Base tray for an espresso machine and a coffee mill. 306,536, 3-13-90, Cl. D6-468.000.
Parker, Bruce H. Connector unit for connecting two bicycles side-by-side. 306,567, 3-13-90, Cl. D12-114.000.
Parker, Christopher H. F., to Geared for Travel Limited. Luggage tag. 306,613, 3-13-90, Cl. D20-27.000.
Parker, James E., to V-Tech, Inc. Pregnancy test kit. 306,645, 3-13-90, Cl. D24-17.000.
Paul Associates, Inc.: *See—*
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Paul, Stanley M., to Paul Associates, Inc. Combined knob and escutcheon. 306,552, 3-13-90, Cl. D8-301.000.

Pawlik, James P.; and Erdall, Margaret A. Door mounted advertising display chime. 306,565, 3-13-90, Cl. D10-118.000.

Peake-Atkins, Sean C., to Polybottle. Bottle. 306,557, 3-13-90, Cl. D9-376.000.

Peck, Donald R.: *See—*
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Pestuglicci, Patricia; and Mosley, Peggy. Combination seat and handbag. 306,543, 3-13-90, Cl. D6-601.000.

Pleatco Electronic & Filter Corp.: *See—*
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Plummer, Robert J., to Medical Product Designs, Inc. Massager or similar article. 306,647, 3-13-90, Cl. D24-40.000.

Plus Corporation: *See—*
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Procter & Gamble Company, The: *See—*
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Drits, Vladimir; and Reshanov, Eugene N., 306,600, Cl. D15-122.000.

Robeson Industries Corporation: *See—*
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Rosdick, Tom. Insulator for fluid containers. 306,545, 3-13-90, Cl. D3-608.000.

Rumpel, Donald D., to Kellogg Plastics, Ltd. Christmas light clip. 306,553, 3-13-90, Cl. D8-395.000.

Sachs, Michael A.; and Males, Howard E. Sneaker. 306,513, 3-13-90, Cl. D2-310.000.

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Cavalier, Serge A., 306,584, Cl. D14-147.000.
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Sanchez, Maureen A. Privacy blanket for a nursing mother. 306,510, 3-13-90, Cl. D2-179.000.

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Scheibenreif, John A.: *See—*
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Schlumberger Industries, Inc.: *See—*
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Schultz, William H., to Skil Corporation. Battery pack. 306,573, 3-13-90, Cl. D13-11.000.

Schultz, William H., to Skil Corporation. Battery pack. 306,574, 3-13-90, Cl. D13-11.000.

Schwinn Bicycle Company: *See—*
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Searby, Frederick G.: *See—*
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Shearer, William B. Golf putter head. 306,629, 3-13-90, Cl. D21-219.000.

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Takara Co., Ltd.: *See—*
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Tek-Aids, Inc.: *See—*
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Wang, Jeng-Shyong. Tambourine or similar article. 306,608, 3-13-90, Cl. D17-22.000.

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Whatley, Ian H., to Genesco Inc. Cleated sole for a sport shoe. 306,517, 3-13-90, Cl. D2-320.000.

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Wilkes, Lori D.: *See—*
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Wolfe, Henry S. Float. 306,633, 3-13-90, Cl. D21-237.000.

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Yokoi, Kenji: *See—*
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Young, Michael: *See—*
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LIST OF PLANT PATENTEES

Bennett, Cecilia L. D., deceased (by O'Brien, Susan Mae, executrix). Miniature rose plant named 'Always A Lady'. 7,187, 3-13-90, Cl. 7.000.

Bennett, Cecilia L. D., deceased; and by O'Brien, Susan M., administrator. Miniature rose plant named 'Hot Lips'. 7,188, 3-13-90, Cl. 7.000.

Bennett, Cecilia L. D., deceased; and by O'Brien, Susan M., executrix. Miniature rose plant named 'Ruthie'. 7,189, 3-13-90, Cl. 7.000.

Bennett, Cecilia L. D., deceased; and by O'Brien, Susan M., executrix. Miniature rose plant named 'Zelda Lloyd'. 7,190, 3-13-90, Cl. 9.000.

Bennett, Cecilia L. D., deceased; and by O'Brien, Susan M., executrix. Miniature rose plant named 'Christopher'. 7,191, 3-13-90, Cl. 10.000.

Bradford, Lowell G.: *See*—
Bradford, Norman G.; and Bradford, Lowell G., 7,193, Cl. 41.000.

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Gardner, Leith M.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,194, Cl. 43.000.

Ito Packing Co., Inc.: *See*—
Taylor, James W., 7,186, Cl. 41.000.

Kitahara, Kei: *See*—
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O'Brien, Susan M., administrator: *See*—
Bennett, Cecilia L. D., deceased; and O'Brien, Susan M., administrator, 7,188, Cl. 7.000.

O'Brien, Susan M., executrix: *See*—
Bennett, Cecilia L. D., deceased; and O'Brien, Susan M., executrix, 7,189, Cl. 7.000.
Bennett, Cecilia L. D., deceased; and O'Brien, Susan M., executrix, 7,190, Cl. 9.000.
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Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,194, Cl. 43.000.

Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,194, Cl. 43.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 13, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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463.4 4,907,688
487.1 4,907,689
498 4,907,690
750 4,907,691
780 4,907,692

CLASS 200

61.43 4,908,483
331 4,908,484
462 4,908,485

CLASS 201

25 4,908,104

CLASS 204

1 T 4,908,105
23 4,908,106
59 F 4,908,107
93 4,908,108
149 4,908,109
157.61 4,908,110
157.62 4,908,111
243 R 4,908,113
252 4,908,114
294 4,908,115
299 R 4,908,112
4,908,116
300 EC 4,908,153
415 4,908,117
424 4,908,118
426 4,908,119

CLASS 206

0.81 4,907,694
44 R 4,907,693
386 4,907,695
411 4,907,696
446 4,907,697
611 4,907,698

CLASS 208

59 4,908,120
85 4,908,121
207 4,908,122

CLASS 209

3.3 4,907,699
133 4,908,123
139.1 4,908,124
166 4,908,125
546 4,907,700
573 4,908,126
576 4,907,701
664 4,907,702

CLASS 210

123 4,908,127
150 4,908,128
170 4,908,129
172 4,908,130
219 4,908,131
446 4,908,132
641 4,908,133
651 4,908,134
654 4,908,135
661 4,908,136
679 4,908,137
700 4,908,138
788 4,908,139

CLASS 211

10 4,907,703
13 4,907,704
4,907,705
46 4,907,706
59.3 4,907,707

CLASS 215

252 4,907,708
4,907,709

CLASS 219

10.55 A 4,908,486
10.55 E 4,908,487
10.55 R 4,908,488
10.77 4,908,489
50 4,908,490
61 4,908,491
121.52 4,908,492
121.67 4,908,493
121.72 4,908,494
343 4,908,495
438 4,908,501
464 4,908,496
494 4,908,498
539 4,908,497

CLASS 220

1 T 4,907,710
3.8 4,907,711
69 4,907,712
76 4,907,713
90 4,907,714
263 4,907,715
326 4,907,716
404 4,907,717

CLASS 221

1 4,907,718

CLASS 222

4,907,719
55 4,907,720
58 4,907,721
83 4,907,722
105 4,907,723
4,907,724
129.1 4,907,725
145 4,907,726
386.5 4,907,727

CLASS 224

42.03 A 4,907,728
253 4,907,729

CLASS 227

8 4,907,730

CLASS 228

2.5 4,907,731
44.5 4,907,732
122 4,907,733
123 4,907,734
173.4 4,907,735
190 4,907,736

CLASS 235

380 4,908,499
4,908,521
384 4,908,500
437 4,908,502
489 4,908,503

CLASS 236

11 4,907,737

CLASS 237

2 B 4,907,738
8 C 4,907,739

CLASS 238

238 4,907,740

CLASS 239

124 4,907,741
230 4,907,742
265.11 4,907,743
449 4,907,744
463 4,907,745
472 4,907,746
578 4,907,747
584 4,907,748
690 4,907,749

CLASS 241

73 4,907,750
119 4,907,751
171 4,907,752
285 R 4,907,753

CLASS 242

7.21 4,907,754
35.5 A 4,907,755
107.3 4,907,756
107.6 4,907,757
125.1 4,907,758
246 4,907,759

CLASS 244

3.12 4,907,763
62 4,907,764
100 R 4,907,760
102 R 4,907,761
118.1 4,907,762
200 4,907,765

CLASS 248

49 4,907,767
57 4,907,766
123.1 4,907,768
185 4,907,769
188.6 4,907,770
222.1 4,907,771
231.7 4,907,772
287 4,907,773
306 4,907,774
311.2 4,907,775
430 4,907,776
453 4,907,777
676 4,907,778

CLASS 250

201 4,908,505
201.2 4,908,504
201.5 4,908,506
223 B 4,908,507
225 4,908,508
231.13 4,908,510
235 4,908,511
288 4,908,512
306 4,908,519
324 4,908,513
327.2 4,908,514
4,908,520
507.1 4,908,515
556 4,908,516
563 4,908,517

CLASS 251

129.18 4,907,779
214 4,907,780

CLASS 252

8.554 4,908,141
8.6 4,908,140
17 4,908,142
4,908,143
47.5 4,908,144
51.5 A 4,908,145
56 R 4,908,146
106 4,908,147
135 4,908,148
139 4,908,149
174.12 4,908,150
188.28 4,908,151
299.63 4,908,152
314 4,908,154
353 4,908,155
511 4,908,156
4,908,157
514 4,908,158
559 4,908,159
608 4,908,160
609 4,908,161

CLASS 254

93 HP 4,907,781
134.3 PA 4,907,782

CLASS 256

32 4,907,783

CLASS 260

405.5 4,908,162

CLASS 264

12 4,908,163
22 4,908,164
4,908,165
4,908,166
29.3 4,908,167
40.1 4,908,168
40.2 4,908,169
46.5 4,908,170
56 4,908,171
62 B1 4,244,813
63 4,908,172
4,908,173
87 4,908,174
113 4,908,175
127 4,908,176
132 4,908,177
272.17 4,908,178

CLASS 266

235 4,907,784

CLASS 267

104 4,907,785
140.1 4,907,786
4,907,787
168 4,907,788

CLASS 269

13 4,907,789
21 4,907,790

CLASS 271

5 4,907,791
240 4,907,792

CLASS 272

3 4,907,793
70.3 4,907,794
93 4,907,795
97 4,907,796
129 4,907,797
134 4,907,798

CLASS 273

23 4,907,799
26 B 4,907,800
26 R 4,907,801
4,907,802
30 4,907,803
73 J 4,907,810
93 R 4,907,804
158 4,907,805
164 4,907,806
240 4,907,807
4,907,808
242 4,907,809

CLASS 276

39.1 4,907,836

CLASS 277

9 4,907,811
117 4,907,812

CLASS 280

11.18 4,907,813
104 4,907,814
304.3 Re.33,178
435 4,907,815
615 4,907,816
4,907,817
642 4,907,818
661 Re.33,179
736 4,907,819
806 4,907,820
808 4,907,821

CLASS 281

15.1 4,907,822
31 4,907,823
45 4,907,824
51 4,907,825

CLASS 283

56 4,907,826
65 4,907,827

CLASS 285

24 4,907,828
4,907,829
91 4,907,830

CLASS 292

216 4,907,831
228 4,907,832
336.3 4,907,833

CLASS 294

88 4,907,834

CLASS 296

1.1 4,907,835
91 4,907,837
202 4,907,838

CLASS 297

6 4,907,839
193 4,907,840

CLASS 300

21 4,907,841

CLASS 303

9.72 4,908,522
13 4,907,842
111 4,907,843

CLASS 307

43 4,908,527
107 4,908,524
202.1 4,908,525
263 4,908,526
309 4,908,527
443 4,908,528
4,908,530
492 4,908,529
512 4,908,532
571 4,908,531

CLASS 310

12 4,908,533
45 4,908,534
4,908,535
51 4,908,536
4,908,537
59 4,908,538
240 4,908,540
270 4,908,541
313 B 4,908,542
334 4,908,543

CLASS 312

321.5 4,908,544

CLASS 313

103 CM 4,908,545
331 4,908,546
471 4,908,547
497 4,908,548

CLASS 315

5.47 4,908,549
8 4,908,550
169.3 4,908,539
209 R 4,908,551
241 P 4,908,552

CLASS 318

382 4,908,553
483 4,908,554
567 4,908,555
568.2 4,908,556
568.22 4,908,559
587 4,908,557
603 4,908,560
648 4,908,558
677 4,908,561
696 4,908,562
760 4,908,563
807 4,908,564

CLASS 322

10 4,908,565

CLASS 323

280 4,908,566
299 4,908,567

CLASS 324

96 4,908,568
120 4,908,569
158 P 4,908,571
158 T 4,908,570
173 4,908,572
207.20 4,908,577
309 4,908,573
4,908,578
675 4,908,574
711 4,908,575

CLASS 328

167 4,908,579
235 4,908,580

CLASS 329

320 4,908,581

CLASS 330

4.3 4,908,584

CLASS 331

1 A 4,908,582
117 R 4,908,583

CLASS 333

24 R 4,908,585
101 4,908,587
105 4,908,588
106 4,908,589
182 4,908,586
183 4,908,590

CLASS 335

27 4,908,652
210 4,908,591
229 4,908,592
255 4,908,593

CLASS 337

49 4,908,594
105 4,908,595
354 4,908,596

CLASS 338

21 4,908,597
22 R 4,908,599
174 4,908,598

CLASS 340

310 R 4,908,600
388 4,908,601
457 4,908,844
514 4,908,602
525 4,908,603
539 4,908,604
542 4,908,605
571 4,908,606
4,908,607
4,908,608
573 4,907,845
702 4,908,609
703 4,908,610
705 4,908,611
706 4,908,612
719 4,908,613
723 4,908,614
917 4,908,615
929 4,908,616
932.2 4,908,617
945 4,908,618
966 4,908,619

CLASS 341

108 4,908,620
120 4,908,621
122 4,908,622
167 4,908,623
172 4,908,624

CLASS 342

25 4,908,625
60 4,908,626
125 4,908,627
134 4,908,628
457 4,908,629

CLASS 343

763 4,908,630

CLASS 346

76 PH 4,908,632
76 R 4,908,631
107 R 4,908,633
108 4,908,634
140 R 4,908,635
4,908,636
4,908,638
160 4,908,637

CLASS 350

1.6 4,907,846
3.73 4,907,847
3.75 4,907,848
96.13 4,907,850
96.14 4,907,849
96.19 4,907,851
96.20 4,907,852
4,907,853
96.23 4,907,854
4,907,855
96.29 4,907,856
4,907,857
286 4,907,858
331 T 4,907,859
334 4,907,860
336 4,907,861
345 4,907,862
358 4,907,863
413 4,907,864
425 4,907,865
426 4,907,866
429 4,907,867
431 4,908,639
463 4,907,868
604 4,907,869
637 4,907,870
639 4,907,871

CLASS 351

160 R 4,907,872

CLASS 353

101 4,907,873

CLASS 354

75 4,908,640
275 4,908,641

400 4,908,642
4,908,643
402 4,908,644
4,908,645
4,908,646
4,908,647
403 4,908,648
4,908,649
412 4,908,650
434 4,908,651

CLASS 355

27 4,908,653
41 4,908,654
50 4,908,655
53 4,908,656
75 4,908,657
76 4,908,658
200 4,908,659
206 4,908,660
211 4,908,661
218 4,908,662
4,908,663
235 4,908,664
245 4,908,665
246 4,908,666
256 4,908,667
274 4,908,668
282 4,908,669
284 4,908,670
298 4,908,671
311 4,908,672
4,908,673
318 4,908,674
326 4,908,675

CLASS 356

4 4,907,874
30 4,907,875
41 4,907,876
72 4,908,676
73.1 4,908,677
121 4,907,877
128 4,907,878
141 4,907,879
151 4,907,880
152 4,907,881
251 4,907,882
317 4,907,883
336 4,907,884
349 4,907,885
4,907,886
352 4,907,887
371 4,907,888
373 4,908,509

CLASS 357

4 4,908,678
15 4,908,679
22 4,908,680
23.11 4,908,683
23.3 4,908,681
23.4 4,908,682
24 4,908,684
27 4,908,685
30 4,908,686
38 4,908,687
41 4,908,688
49 4,908,691
51 4,908,692
67 4,908,689
68 4,908,690
4,908,693
74 4,908,694
81 4,908,695
4,908,696

CLASS 358

12 4,908,697
13 4,908,698
22 4,908,699
4,908,700
51 4,908,720
80 4,908,701
93 4,908,702
106 4,908,703
108 4,908,704
109 4,908,705
147 4,908,706
4,908,707
206 4,908,708
213.19 4,908,709
213.23 4,908,518
236 4,908,710
296 4,908,711
298 4,908,712
335 4,908,713
405 4,908,714
453 4,908,716
474 4,908,717
494 4,908,718
4,908,719

CLASS 360

40 4,908,721
46 4,908,722
85 4,908,723
92 4,907,889
97.02 4,908,715
123 4,908,724
132 4,908,725
133 4,908,726
135 4,908,727
137 Re.33,180
4,908,728

CLASS 361

118 4,908,729
120 4,908,730
159 4,908,731
170 4,908,732
356 4,908,733
383 4,908,734
406 4,908,735
408 4,908,736
419 4,908,737
429 4,908,738

CLASS 362

23 4,908,739
144 4,908,740
154 4,908,741
156 4,908,742
238 4,908,743

CLASS 363

4 4,908,744
17 4,908,752
21 4,908,753
37 4,908,754
56 4,908,755
58 4,908,756
141 4,908,757

CLASS 364

140 4,908,745
147 4,908,746
162 4,908,747
200 4,908,748
4,908,749
4,908,750
4,908,751
300 4,908,758
4,908,759
400 4,908,760
401 4,908,761
413.09 4,908,762
420 4,908,763
426.04 4,908,764
431.05 4,908,765
448 4,908,766
453 4,908,767
464.02 4,908,770
464.03 4,908,768
464.04 4,908,769
486 4,908,771
491 4,908,772
496 4,908,773
507 4,908,774
508 4,908,775
509 4,908,776
513 4,908,777
4,908,778
518 4,908,779
521 4,908,780
524 4,908,781
560 4,908,782
4,908,783
569 4,908,784
576 4,908,785
710.11 4,908,786
724.10 4,908,787
748 4,908,788
900 Re.33,181
4,908,789
4,908,790
4,908,791
4,908,792

CLASS 365

52 4,908,793
189.01 4,908,795
189.05 4,908,796
189.08 4,908,794
207 4,908,797
230.03 4,908,798
241 4,908,799

CLASS 366

27 4,907,890
76 4,907,891
101 4,907,892
144 4,907,893

CLASS 367

13 4,908,800
23 4,908,801
77 4,908,803
81 4,908,804
149 4,908,802
181 4,908,805

CLASS 368

9 4,908,806
89 4,908,807
157 4,908,808

CLASS 369

13 4,908,809
50 4,908,810
54 4,908,811
59 4,908,812
94 4,908,813
100 4,908,814
116 4,908,815
215 4,908,816
291 4,908,817

CLASS 370

15 4,908,818
4,908,819
38 4,908,820
60 4,908,821
85 4,908,822
85.1 4,908,823
85.15 4,908,824
110.3 4,908,825

CLASS 371

22.3 4,908,576
40.1 4,908,826
43 4,908,827
69.1 4,908,828

CLASS 372

29 4,908,829
46 4,908,830
4,908,831
75 4,908,832
96 4,908,833

CLASS 374

45 4,908,835
120 4,907,894
130 4,907,895
190 4,907,896

CLASS 375

1 4,908,836
4,908,837
15 4,908,838
40 4,908,839
60 4,908,840
81 4,908,841
119 4,908,842

CLASS 376

203 4,908,179
361 4,908,180

CLASS 378

99 4,908,843
209 4,908,844

CLASS 379

51 4,908,845
58 4,908,846
61 4,908,847
63 4,908,848
67 4,908,849
88 4,908,850
100 4,908,851
130 4,908,852
355 4,908,853
373 4,908,854
387 4,908,855
413 4,908,856
418 4,908,857

CLASS 380

5 4,908,834
10 4,908,859
19 4,908,860
25 4,908,861
28 4,908,862

CLASS 381

1 4,908,858
36 4,908,863
43 4,908,864
4,908,865
44 4,908,866
51 4,908,867
59 4,908,868
79 4,908,869
96 4,908,870

CLASS 382

8 4,908,871
22 4,908,872
34 4,908,873
41 4,908,874
52 4,908,875
54 4,908,876

CLASS 384

446 4,907,897
564 4,907,898
620 4,907,899

CLASS 400

63 4,907,900
157.2 4,907,901
249 4,907,902

CLASS 401

151 4,907,903

CLASS 402

80 R 4,907,904
4,907,905

CLASS 403

154 4,907,906
171 4,907,907
393 4,907,908

CLASS 404

37 4,907,909

CLASS 405

132 4,907,910
154 4,907,911
208 4,907,912
211 4,907,913
224 4,907,914
229 4,907,915
236 4,907,916
261 4,907,917
303 4,907,918

CLASS 409

81 4,907,919
132 4,907,920

CLASS 410

111 4,907,921

CLASS 411

43 4,907,922
107 4,907,923
303 4,907,924
339 4,907,925
366 4,907,926
368 4,907,927
387 4,907,928
431 4,907,929
437 4,907,930

CLASS 414

140.9 4,907,932
225 4,907,931
334 4,907,933
462 4,907,934
495 4,907,935
545 4,907,936
735 4,907,937
749 4,907,938
786 4,907,939
789.6 4,907,940
795.8 4,907,941
798 4,907,942

CLASS 415

1 4,907,943
65 4,907,944
117 4,907,945
209.3 4,907,946

CLASS 416

241 R 4,907,947

CLASS 417

53 4,907,948
252 4,907,949
271 4,907,950
368 4,907,951
407 4,907,952
444 4,907,953

CLASS 418

200 4,907,954

CLASS 420

405 4,908,181
430 4,908,182
448 4,908,183
534 4,908,184
588 4,908,185

CLASS 422

64 4,908,186
81 4,908,187
111 4,908,188
186.19 4,908,189
276 4,908,190

CLASS 423

210 4,908,191
213.2 4,908,192
235 4,908,193
4,908,194
239 4,908,195
278 4,908,196
386 4,908,270
412 4,908,197
415 R 4,908,198
437 4,908,199
448 4,908,200
574 R 4,908,201

CLASS 424

9 4,908,202
86 4,908,203
94.2 4,908,204
94.64 4,908,205
95 4,908,206
195.1 4,908,207
409 4,908,208
4,908,209
439 4,908,210
440 4,908,211
4,908,212
447 4,908,213
477 4,908,214
661 4,908,215

CLASS 425

3 4,908,216
87 4,907,955
110 4,907,956
132 4,907,957
253 4,908,217
384 4,907,958
406 4,907,959
593 4,907,960

CLASS 426

2 4,908,218
15 4,908,219
61 4,908,220
240 4,908,221
241 4,908,222
565 4,908,223
634 4,908,224

CLASS 427

25 4,908,225
38 4,908,226
44 4,908,227
54.1 4,908,228
4,908,229
4,908,230
55 4,908,231
72 4,908,232
213.35 4,908,233
236 4,908,234
243 4,908,235
245 4,908,236
314 4,908,237
389 4,908,238
4,908,239
391 4,908,240
437 4,908,241
443.1 4,908,242
445 4,908,243

CLASS 428

8 4,908,244
27 4,908,252
33 4,908,245
34.1 4,908,246
34.9 4,908,247
36.9 4,908,249
64 4,908,250
68 4,908,251
114 4,908,253
119 4,908,254
131 4,908,255
133 4,908,256
147 4,908,257
198 4,908,258
209 4,908,259
215 4,908,260
216 4,908,261
283 4,908,262
286 4,908,263
294 4,908,264
318.4 4,908,265
333 4,908,266
4,908,267
4,908,268
355 4,908,248
369 4,908,269
402.22 4,908,271
412 4,908,272
413 4,908,273
452 4,908,274
457 4,908,275
458 4,908,276
480 4,908,277
500 4,908,278
659 4,908,279
679 4,908,280

CLASS 429

27 4,908,281
59 4,908,282
192 4,908,283
4,908,284

CLASS 430

1 4,908,285
10 4,908,286
45 4,908,301
58 4,908,287
4,908,288
59 4,908,289
106.6 4,908,290
122 4,908,291
128 4,908,292
264 4,908,293
270 4,908,294
272 4,908,295
281 4,908,296
284 4,908,297
313 4,908,298
323 4,908,299
393 4,908,300
544 4,908,302
569 4,908,303
615 4,908,304

CLASS 431

8 4,907,961
174 4,907,962
189 4,907,963
202 4,907,964

CLASS 433

3 4,907,965
37 4,907,966
73 4,907,967
80 4,907,968
173 4,907,969

CLASS 434

45 4,907,970
167 4,907,971
255 4,907,972
262 4,907,973

CLASS 435

5 4,908,305
4,908,306
6 4,908,307
4,908,308
23 4,908,309
101 4,908,310
4,908,311
108 4,908,312
129 4,908,313
219 4,908,314
240.4 4,908,315
253.4 4,908,316
262 4,908,317
270 4,908,318
285 4,908,319

CLASS 436

45 4,908,320
57 4,908,321
111 4,908,322
135 4,908,323

CLASS 437

31 4,908,324
40 4,908,325
44 4,908,326
4,908,327
63 4,908,328
101 4,908,329
129 4,907,974
170 4,908,330
187 4,908,331
192 4,908,332
195 4,908,333
200 4,908,334

CLASS 439

67 4,907,975
72 4,907,976
74 4,907,977
79 4,907,978
4,908,335
83 4,907,979
204 4,907,980
258 4,907,981
271 4,907,982
278 4,907,983
369 4,907,984
4,907,985
496 4,908,336
535 4,907,986
571 4,907,987
751 4,907,988
812 4,907,989
851 4,907,990
876 4,907,991
4,908,337

CLASS 440

50 4,907,992
61 4,907,993
4,907,994

CLASS 441

3 4,907,995
4,907,996
61 4,907,519

CLASS 445

9 4,907,998
66 4,907,999

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	4,908,004
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135	4,908,007
146	4,908,008

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14	4,907,474
89	4,907,472
250	4,907,473

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178	4,908,009
357	4,908,010

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1	4,908,338
32	4,908,339
95	4,908,340

CLASS 502

30	4,908,341
68	4,908,342
218	4,908,343
313	4,908,344

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227	4,908,345

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1	4,908,346
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CLASS 512

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CLASS 514

2	4,908,350
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12	4,908,352
19	4,908,353
21	4,908,354
63	4,908,355
90	4,908,356
92	4,908,357
177	4,908,358
210	4,908,359
213	4,908,360
219	4,908,361
231.2	4,908,362
235.8	4,908,363
243	4,908,364
252	4,908,365
	4,908,366
253	4,908,367
256	4,908,368
274	4,908,379
277	4,908,369
305	4,908,370
318	4,908,371
322	4,908,372
327	4,908,373
330	4,908,374
342	4,908,375
402	4,908,376
404	4,908,377
414	4,908,378
452	4,908,380
460	4,908,381
471	4,908,382
485	4,908,383
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653	4,908,387
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772	4,908,389

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706	4,908,390

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163	4,908,394

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CLASS 523

202	4,908,396
400	4,908,397

CLASS 524

99	4,908,398
243	4,908,399
303	4,908,400
495	4,908,401
	4,908,402
818	4,908,403

CLASS 525

54.11	4,908,404
61	4,908,405
64	4,908,406
113	4,908,407
124	4,908,408
276	4,908,410
285	4,908,411
286	4,908,412
304	4,908,413
316	4,908,414
356	4,908,415
411	4,908,416
422	4,908,417
425	4,908,418
	4,908,419

CLASS 526

76	4,908,420
147	4,908,421

CLASS 527

67	4,908,422

CLASS 528

55	B1 4,584,362
97	4,908,423
	4,908,424
125	4,908,425
	4,908,426
	4,908,427
188	4,908,409
272	4,908,428
353	4,908,429
	4,908,430

CLASS 530

351	4,908,432
	4,908,433
387	4,908,431
417	4,908,434

CLASS 534

637	4,908,436
738	4,908,437
761	4,908,435

CLASS 536

6.4	4,908,438
17.4	4,908,439
23	4,908,440
27	4,908,441

CLASS 540

145	4,908,442
221	4,908,443
230	4,908,444
527	4,908,445
553	4,908,446

CLASS 544

124	4,908,447
289	4,908,448

CLASS 546

67	4,908,449
94	4,908,450
267	4,908,451
286	4,908,452

CLASS 548

113	4,908,453
193	4,908,454
268.4	4,908,455
312	4,908,456
324	4,908,457
328	4,908,458

CLASS 549

215	4,908,459
455	4,908,461
511	4,908,460

CLASS 556

147	4,908,462
179	4,908,463

CLASS 558

81	4,908,464
175	4,908,465
488	4,908,466

CLASS 560

12	4,908,467
14	4,908,468
17	4,908,469
46	4,908,470
77	4,908,471
104	4,908,472
	4,908,473
109	4,908,474
115	4,908,475
144	4,908,476
248	4,908,477

CLASS 562

55	4,908,478

CLASS 564

277	4,908,479
409	4,908,480

CLASS 568

308	4,908,481

CLASS 600

12	4,908,011
16	4,908,012
36	4,908,013

CLASS 604

4	4,908,014
22	4,908,015
67	4,908,017
83	4,908,018
85	4,908,019
110	4,908,020
118	4,908,023
168	4,908,021
195	4,908,022
300	4,908,024
327	4,908,025
378	4,908,026
890.1	4,908,027

CLASS 606

5	4,907,586
11	4,907,588
15	B1 4,784,132
28	4,907,585
	4,907,587
34	4,907,589
79	4,907,578
87	4,907,577
128	4,907,572
139	4,907,590
154	4,907,591

CLASS 623

2	4,908,028
8	4,908,029
16	4,908,030
18	4,908,032
21	4,908,031
22	4,908,033
23	4,908,034
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	4,908,036
32	4,908,037

CLASS 902

5	4,908,038

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D2—	179	306,510
	191	306,511
	246	306,512
	310	306,513
	314	306,514
	318	306,515
	320	306,516
		306,517
	605	306,518
D3—	40	306,520
	74	306,519
	100	306,521
	608	306,545
D4—	104	306,522
	116	306,523
	122	306,524
	138	306,525
		306,526
		306,527
D6—	309	306,528
	310	306,529
	347	306,530
	366	306,531
	396	306,532
	412	306,533
	419	306,534
		306,535
	468	306,536
	472	306,537
	477	306,538
		306,539
		306,540
	515	306,541
	553	306,542
	601	306,543
D7—	317	306,547
	605	306,546
	620	306,544
D8—	36	306,548
	42	306,549
	99	306,550
	104	306,551
	301	306,552
	395	306,553
D9—	300	306,554
	305	306,555
	341	306,556
	376	306,557
	378	306,558
	384	306,559
		306,560
	415	306,561
	424	306,562
	434	306,563
D09—	455	306,564
D10—	118	306,565
D12—	7	306,566
	114	306,567
	120	306,568
	156	306,569
		306,570
	181	306,571
		306,572
D13—	11	306,573
		306,574
	35	306,575
	40	306,576
	99	306,577
D14—	109	306,578
		306,579
	113	306,580
	126	306,581
		306,582
	137	306,583
	147	306,584
		306,585
	149	306,586
	151	306,587
	163	306,588
	165	306,589
		306,590
	168	306,591
	214	306,592
	231	306,593
	253	306,594
D15—	1	306,595
	7	306,596
	10	306,597
	11	306,598
	22	306,599
	69	306,601
	122	306,600
	144.1	306,602
	199	306,603
D16—	104	306,604
	130	306,605
	133	306,606
	209	306,607
D17—	22	306,608
D18—	4	306,609
	22	306,610
D19—	64	306,611
	67	306,612
D20—	27	306,613
	42	306,614
D21—	48	306,615
	87	306,616
	148	306,617
	150	306,618
		306,619
		306,620
		306,621
		306,622
		306,623
	159	306,624
	171	306,625
	194	306,626
	208	306,627
	212	306,628
	219	306,629
		306,630
	228	306,631
	234	306,632
	237	306,633
D22—	104	306,634
		306,635
		306,636
	119	306,637
	137	306,638
D23—	205	306,639
	209	306,640
	311	306,641
	351	306,642
	366	306,644
	413	306,643
D24—	17	306,645
	36	306,646
	40	306,647
	54	306,648
	56	306,649

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4,907,543	4,907,764	4,908,331	4,907,950	4,907,456	4,907,921
4,907,763	4,907,788	4,908,339	4,908,017	4,907,554	4,907,924
4,907,835	4,907,794	4,908,347	4,908,044	4,907,592	4,907,972
4,908,110	4,907,798	4,908,350	4,908,064	4,907,627	4,907,978
02 : 4,907,769	4,907,824	4,908,387	4,908,194	4,907,692	4,908,002
04 : 4,907,348	4,907,839	4,908,403	4,908,617	4,907,714	4,908,021
4,907,382	4,907,841	4,908,442	4,908,777	4,907,729	4,908,096
4,907,408	4,907,848	4,908,482	4,908,826	4,907,795	4,908,103
4,907,713	4,907,860	4,908,519	4,908,874	4,907,805	4,908,113
4,907,715	4,907,864	4,908,521	09 : 4,907,342	4,907,943	4,908,122
4,907,819	4,907,870	4,908,524	4,907,502	4,907,963	4,908,145
4,907,856	4,907,881	4,908,525	4,907,604	4,907,969	4,908,153
4,907,947	4,907,884	4,908,528	4,907,622	4,907,979	4,908,230
4,908,066	4,907,885	4,908,530	4,907,633	4,907,993	4,908,265
4,908,258	4,907,887	4,908,531	4,907,639	4,908,018	4,908,445
4,908,569	4,907,895	4,908,543	4,907,700	4,908,190	4,908,487
4,908,688	4,907,916	4,908,573	4,907,717	4,908,207	4,908,542
4,908,857	4,907,925	4,908,588	4,907,767	4,908,211	4,908,565
4,908,873	4,907,926	4,908,589	4,907,777	4,908,213	4,908,570
05 : 4,907,373	4,907,931	4,908,597	4,907,804	4,908,523	4,908,754
06 : 4,907,298	4,907,939	4,908,600	4,907,810	4,908,537	4,908,806
4,907,302	4,907,965	4,908,606	4,907,826	4,908,566	4,908,817
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4,907,312	4,907,980	4,908,679	4,907,930	13 : 4,907,603	4,907,433
4,907,332	4,907,982	4,908,686	4,908,137	4,907,710	4,907,527
4,907,340	4,907,984	4,908,699	4,908,179	4,907,724	4,907,666
4,907,352	4,907,985	4,908,702	4,908,183	4,908,147	4,907,966
4,907,359	4,907,989	4,908,715	4,908,301	4,908,252	4,908,439
4,907,367	4,908,012	4,908,724	4,908,316	4,908,730	4,908,522
4,907,388	4,908,019	4,908,740	4,908,404	16 : 4,907,444	4,908,544
4,907,396	4,908,022	4,908,742	4,908,440	17 : 4,907,301	4,908,554
4,907,458	4,908,025	4,908,743	4,908,494	4,907,311	4,908,731
4,907,474	4,908,027	4,908,776	4,908,502	4,907,321	19 : 4,907,364
4,907,488	4,908,037	4,908,780	4,908,585	4,907,324	4,907,470
4,907,499	4,908,086	4,908,804	4,908,612	4,907,327	4,907,567
4,907,519	4,908,088	4,908,815	4,908,751	4,907,336	4,907,837
4,907,540	4,908,116	4,908,816	4,908,768	4,907,343	4,907,890
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4,907,578	4,908,134	4,908,827	10 : 4,907,518	4,907,420	4,907,671
4,907,581	4,908,142	4,908,828	4,907,524	4,907,423	4,907,674
4,907,586	4,908,143	4,908,832	4,907,609	4,907,565	4,908,177
4,907,600	4,908,162	4,908,842	4,907,711	4,907,636	4,908,310
4,907,612	4,908,193	4,908,850	4,908,056	4,907,685	4,908,758
4,907,613	4,908,203	4,908,859	4,908,112	4,907,703	21 : 4,907,482
4,907,618	4,908,205	4,908,868	4,908,296	4,907,716	4,907,754
4,907,643	4,908,226	4,908,875	4,908,453	4,907,727	4,907,785
4,907,665	4,908,229	4,908,876	4,908,461	4,907,742	22 : 4,907,651
4,907,687	4,908,262	08 : Re.33,179	11 : 4,907,807	4,907,750	4,907,657
4,907,693	4,908,309	4,907,357	4,908,224	4,907,766	4,907,893
4,907,706	4,908,320	4,907,449	12 : Re.33,180	4,907,791	4,908,218
4,907,731	4,908,325	4,907,599	4,907,297	4,907,832	4,908,238

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56 : 4,907,620

DESIGN PATENTS

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306,534
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306,546
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47 : 306,516
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48 : 306,643
50 : 306,632
51 : 306,604
55 : 306,537
306,565
306,598
306,641

PLANT PATENTS

06 : 7,186
7,187

7,188
7,189

7,190
7,191

7,192
7,193

7,194

12 : 7,195

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